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THE DOCTOR AND MODERN ECONOMICS

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WHEN the president of the Minnesota State Medical Association rose to address his colleagues on the occasion of the annual meeting of the society in the days of our fathers, it was usually to make an oration, but never to review the events of his own administration as president of his association.

But today medicine and the activities of the state medical associations have changed. The interests of the medical man are economic and social as well as scientific. He is vitally concerned in the social trends of the times. His organization is leading in the defence of human rights against the allied slaveries of communism and its derivatives on the one hand and fascism on the other.

That is why I venture to talk to you tonight about the work of this association during the past year, confident that doctors and their wives of 1936 will want to know where organized medicine stands in Minnesota today in relation to other directing influences in our lives.

1. Are the doctors of Minnesota taking their proper place in the handling of the tremendous problem of relief for the sick poor?

2. Are they aware of all the changes to which the Social Security Act has opened the door? Are they taking hold with a good will and keen foresight, to keep the expenditure of Social Security funds within the legitimate limits of needed public health work, or are they allowing too much of it to line the pockets of politicians?

3. Are they doing their share to keep state legislators informed about the menace of quacks and the need for laws to keep them from preying upon the sick and helpless?

4. Are they doing their share to educate these same people in the fundamentals of good health and of disease prevention so as to protect them from cults and patent medicine and fake healers?

5. Are they reaching out to join hands with the men and women of allied professions for the mutual protection of their own interests and for the public good?

6. Are they working with the women of the Auxiliary so as to utilize their unquestioned influence in the councils of the important women's organizations of the country, the Women's Federations, the Parent Teacher Associations, to prevent them from going off at costly and dangerous tangents in the matter of health and public welfare?

These are important questions. Some of them I should like to answer by a résumé of actual accomplishments this year.

When the SERA wound up its activities this year, medical care for relief clients was working smoothly under SERA regulations. This SERA plan for care of the relief clients was a vast improvement over the system, or lack of any system, in existence in many parts of the state before that time. In consequence, a good many people were receiving good medical care early for troubles that once were left untreated. Physicians were receiving for the first time in years a sufficient fee to cover the cost at least, of caring for these people. And the whole plan was working with a minimum of dissatisfaction and complaint from any one. It is to the great credit of physicians that relief workers from many parts of the state have heartily commended the cordial and helpful manner in which the doctors of the state coöperated in their work.

*Presented at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, June 4, 1936.

Differences and misunderstandings were ironed out in most places by the Committees of Three organized more than a year ago by the state society. The whole program served an invaluable purpose in showing doctors, relief workers and county officials that care for the poor on the basis of free choice of physician is a practicable and desirable plan.

The Minnesota State Medical Association and organized medicine in general, as you know, regards the free choice of physician to the patient as fundamental to good medical care in any class of society. Your Council passed a resolution re-affirming that stand.

When federal funds were no longer available for direct relief in the state, the SERA ended, as such. New plans for medical care of the sick poor had to be made. But the depression and the nearly universal collapse of local county and township machinery for caring for the poor and needy came close to wiping the slate clean of ancient and outworn machinery for caring for the indigent.

Funds for medical care and for relief of all sorts were restricted to county funds aided by a limited allotment of state funds.

The opportunity was provided for negotiations on a new basis between county officials and physicians—literally, the opportunity of a lifetime, for the physicians and for the sick poor whom they serve.

It is to the credit of a great many of the men who are here tonight that they seized so quickly upon this opportunity and already are established with their county commissioners, or the welfare board appointed by the commissioners, on a sound basis of free choice for the patient and a small remuneration, at least, for the work done by the physician.

Others are engaged in negotiations now and only a few, comparatively, have returned to the unfortunate and undesirable system of a hired county physician for care of all the sick poor.

The state association is making one of the greatest efforts in its history to assist its members everywhere, but particularly in the rural districts, to take advantage of this unique chance to settle once and for all that most difficult and troublesome of all economic problems, the care of the sick poor.

The importance to the future of medicine in Minnesota of successful negotiations with the officials of each county cannot be overestimated. It is through the needs of the poor and the wholly indigent that unwholesome experiments to provide care take their origin and fasten themselves upon us. If we are laggard in forestalling such experiments, if we fail to work wholeheartedly for a sound solution of the problem, then we are the losers as well as the sick. We shall certainly wake up some fine day to find the whole problem—and with it our independence and integrity as a profession—removed from our shoulders.

Our relation to the Social Security program made possible through the Social Security Act is only now taking shape. We hope, by means of careful coöperation between our Council and Dr. Chesley and the State Board of Health, and by the interest and assistance of every member of this association, to assist in extending needed services with these funds to those who now lack them.

No one doubts the need of more funds for the fundamental public health services. Ideally, of course, these funds should be raised in the communities that are to benefit by them. When federal subsidies are available local sources of funds are only too likely to dry up; the sense of local responsibility for the handling of community problems is likely to suffer also.

It must be our business as physicians and as responsible citizens to take a more active part than ever before in the public health work of our communities. That way and that way only, shall we be able to avoid waste of funds upon arbitrary programs dictated from outside without knowledge of local conditions, to direct the program into wholesome and appropriate channels, to keep alive a local interest and responsibility without which the mere expenditure of funds will in the long run be of very little use to any one.

We have long recognized our obligation to extend public knowledge of the fundamentals of healthy living and to protect the public from the predatory quack and from the unbalanced cultist and fanatic. That is a fundamental obligation of the doctor. As an organization we have maintained a notable contact with our legislature. We have carried on a weekly radio program, weekly news services, college lecture courses, other pub-

lic talks as they are requested, for years. These are essential services that must continue no matter what federal programs of public health education are dangled before us in dazzling prospect. We can and we must do more, individually, both as medical men and auxiliary members, to educate patients and associates. This is part of the personal obligation of the doctor to his patient. It cannot be left wholly to a bureau any more than diagnosis of disease can be left to a bureau. I want to urge every man here to steel himself anew against the fatal temptation to let the outside organization or the welfare worker or the health department do it. It may be that the health department or the school clinic can immunize your young patient effectively enough against diphtheria and, too, conveniently for you. That does nothing whatever to cement your friendly relationship with that young patient who needs to know you as a friend and the source of all wisdom and aid for all his life so far as his physical well being goes. You cannot in conscience farm out part of your services to that child.

This matter of lay education has many ramifications. It came up in an entirely new guise this year in connection with the year's debates among high school and college students on the subject of state medicine.

Now debates as a rule are mere intellectual exercises so far as young orators are concerned, and do not greatly affect opinions or disturb normal relations in real life. But this year's subject, involving illness and the handling of illness, touched the public rather closely and considerable interest was evinced not only by coaches but by debaters themselves in the subject.

Our state society exerted itself to assist both coaches and debaters to prepare for these debates. We urged upon our members that it was really important to see that these youngsters had a chance to learn the truth about medical problems and the doctors' point of view toward state medicine. It was not only the opinions of these young debaters but those of their thousands of elders who would hear the debates that might be crystallized one way or another by these debates.

I am sorry to have to report to you tonight that our assistance to these young debaters was not as effective as we hoped it might be.

Perhaps the fault lay with us and the material we supplied. Perhaps it lay with our membership, which in many instances was too busy and too indifferent to see that local high schools had the material available from both the American Medical Association and state association headquarters and to lend the personal assistance and explanation that was vital to the understanding of immature youngsters of this difficult and complicated subject.

Our latest information on the results of the regional debates in the state indicates that the affirmative, favoring "a system of medical care at government expense for all the people," had the best of it.

In themselves, no great importance attaches to these debates, perhaps. We know that public opinion as a whole in Minnesota is in no mood as yet for state medicine. We cannot blink the fact, however, that the tendency of all "planned economy" is toward coöperatives as our major political party terms them, group protection and immunity of the individual from ultimate responsibility for his own well being.

We, as physicians, are not prepared to fight a whole social philosophy. We *are* prepared to interpose our influence against a sweeping tendency to remove from the individual all rights and responsibilities. We believe that in America, at least, there is no need to sacrifice a great profession, a scientific development that is the wonder of the world, and the individual right in the selection of one's own doctor, to a social idea.

We believe that reforms can be made if necessary in governmental practices, in our banking system, and even in our distribution of wealth, without sweeping the best developments of American life into the discard.

But we must organize closely and fight cannily to maintain that belief. If we are strong enough and vigorous enough and wise enough we can prevail. If we are indifferent and selfish and hesitant we stand to lose more than our independent and professional integrity. America stands to lose one of its finest institutions—the family doctor.

STUDIES IN WATER BALANCE, DEHYDRATION AND THE ADMINISTRATION OF PARENTERAL FLUIDS*

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REST, water and food have been recognized for centuries as the keystone in the care of the sick. In many illnesses the normal intake of fluids is unhampered, but in others the need for and value of administering fluids by channels other than the gastro-intestinal tract is generally known and appropriate methods for doing so are widely used. The amount of fluid to give in the latter cases is entirely in the hands of the physician, and, while experience has been a fairly reliable teacher, it was apparent to us that the handling of the water requirements of the sick patient by figures based on facts would be of merit. Accordingly, an investigation of the water exchange of surgical patients under the various conditions of disease and treatment was begun four years ago. Before presenting the results of these studies, a brief review of normal water exchange is in order.

Normal Water Exchange

Water becomes available to the body from two main sources and is normally excreted through three channels. These can be listed as follows:

Available Water

1. Fluids drunk
2. Food: Diet or body tissue
   a. Water content
   b. Water of oxidation

Excreted Water

1. Water of urine
2. Water of stool
3. Water vapor

In response to various demands a balance between the factors of intake and output maintains the water content of the body at a fairly constant level of approximately 70 per cent of the total body weight.

While our first thought on water intake is that of fluids drunk, it is of interest that the water available from the solid food of a routine maintenance diet frequently furnishes more than half of the total daily supply. This water from food comes from two sources: its water content, and water formed on the combustion of the constituent proteins, fats and carbohydrates. In this way a little more than nine-tenths of a gram of water is furnished by each gram of solid food eaten, the total food for the day yielding 1,000 to 1,500 c.c. of water. When no food is eaten, body tissue is burned for energy and its water content and water of oxidation likewise become available. Under this condition a great deal of the tissue used is fat, the water content of which is very low, so that only 400 c.c. or so of water daily is available from this endogenous source in starvation.

Fluids drunk generally vary from 800 to 2,000 c.c. daily. When the sweating loss is high, as with hard physical labor or with high temperatures and humidities, larger volumes are ingested.

The output of water is normally concerned with two functions: the excretion of waste materials in solution by the kidneys, and the dissipation of heat by the vaporization of water from the skin and lungs. The third loss, that of water in feces, is normally of no consequence, since it is seldom more than 150 c.c. daily.

Water for vaporization plays an important part in the dissipation of body heat and control of body temperature. The skin encloses a mass of very fluid tissue and always has some moisture on its surface, even without activity by the sweat glands. Under these conditions, vaporization of water from the skin and lungs dissipates 24 per cent of body heat, the process at this rate having been shown by Newburgh and his associates to require for the normal adult from 1,000 to 1,500 c.c. of water daily. The remaining 76 per cent of body heat is dissipated by radiation, conduction and convection from the skin surface. As environmental temperature increases, these latter methods of heat dissipation are less effective, and the sweating mechanism, which can be considered as the safety factor in heat dissipation, pours water upon the surface of the body for vaporization, until up to 100 per cent of total body heat may be dispersed by this process and several liters of water may be used by it daily.

*From the Department of Surgery, University of Michigan. Read before the Minnesota State Medical Society, Minneapolis, Minnesota, May 5, 1936.

It is important to emphasize that the vaporizing process, in contrast to water for kidney function, is little affected by the amount of water available. There is no mechanism whereby, when the water supply is low, temperatures can be controlled with the use of less water than usual. In deprivation of water for long periods of time the urine output may drop to almost nothing, insufficient water may be available to keep internal body temperature within normal limits, but water still continues to be vaporized from the skin and lungs until critical dehydration and death occurs. Water for vaporization apparently has "preferential rights" on available water.

On the other hand, the kidneys, through their concentrating mechanism, may carry out their normal function with variable amounts of water, the quantity so used depending upon the water available after the preferential processes have been cared for. With the usual drinking and eating, the balance between the intake and output of fluid is largely maintained by the kidneys. It is extremely important to remember that on this basis a satisfactory ingestion of water is shown by a good urine output, and that a small volume of urine of high specific gravity practically always indicates insufficient water.

Turning now to the surgical patients, the results and thoughts from the study of this group can be presented under the following headings:

Dehydration Attendant on Surgical Operations

It is common knowledge that on the day of a major operation a restriction of the fluid and food intake by most surgical patients reduces the quantity of available water. Along with this, abnormal losses of fluid generally occur. Our first study on water exchange was to evaluate these losses when they seemed to be greatest, that is, in the operating room and in the immediate post-operative recovery period of four hours, when the patient is bundled up with extra blankets and frequently perspires profusely.

For abdominal operation the blood loss was generally greater than that estimated by the operating surgeon. The largest amount in the series of cases was 1,272 c.c., shed during a radical mastectomy on a large, obese woman. The patient showed moderate post-operative shock.

The total fluid loss by blood, vomitus, urine, and vaporization, for major operations, during the operative and four hour post-operative period averaged close to one liter. Water vaporized from the skin and lungs comprised 70 per cent of this figure. We learned that we could materially reduce the sweating loss by doing away with the extra blankets of the old-fashioned "ether bed." The patients also were much more comfortable by simply placing them post-operatively in a hot-water-bottle-warmed bed with only the usual covers. Water needlessly lost was thus saved and the urine volume on the day of operation correspondingly increased. This procedure has been adopted as a satisfactory routine on the surgical service, with no increase in post-operative pulmonary complications.

As a result of the restriction in fluid and food intake and the increased fluid losses, most patients dehydrate to some extent on the day of their operation. Usually this is not severe and conditions are generally such that more fluid can be taken by the patient on succeeding days, with the water exchange returning to normal. Occasionally, as mentioned previously, fluid cannot be handled by the gastro-intestinal tract, and must be given through other channels. The quantity to be administered in such instances, of course, depends upon the physician, and he can only decide upon the proper amount to give when he knows what fluid losses must be taken care of. Our second study of water exchange was carried out to furnish data on this problem.

The Daily Water Losses of Surgical Patients

Like the healthy adult, the excretion of water by the surgical patient is for two normal functions: the carrying away of water materials through the kidneys, and the dissipation of body heat. Since the latter process seems to have first choice on the available water, and the kidneys work largely with what is left, our problem was to learn what the vaporizing loss amounted to in a group of representative surgical patients. Briefly, the method for this determination was as follows: The patient, lying on a Bradford frame, was weighed at 8:00 A. M. The weight of all ingesta and excreta up to 8:00 A. M. the following morning was obtained, at which time the patient was again weighed.

The total insensible loss of weight for the 24 hour period was calculated by the following equation: Beginning weight—(end weight—ingesta + urine and stool and any abnormal loss). This total insensible loss is the result of the continuous vaporization of water from the skin and lungs and the respiratory exchange of carbon dioxide for oxygen. Water, however, usually comprises more than 90 per cent of the insensible loss, and for our purposes the loss was considered to be entirely water, with little error.

It was found that the average adult patient, convalescing smoothly from a major operation, vaporized from 1,000 to 1,500 c.c. of water daily.

This is the same amount that these individuals would vaporize when up and about at normal routine activities without sweating. A girl weighing 66 pounds vaporized 850 gm. daily during an uneventful convalescence from a simple major operation.

Some conditions met with in surgery increase the insensible loss. Several patients with hyperthyroidism were studied and their water of vaporization amounted to from 1,500 to 2,000 c.c. daily. This increase above the normal was simply found to be due to the fact that they have more heat to dissipate, there being no increase in the percentage of heat dispersed by the vaporizing process. With fever also there is an increase in heat production, and a tendency to sweat. The water of vaporization of several patients with fever varied from 1,500 to 2,500 c.c. daily. In general, for the sick surgical patient, water for vaporization can be safely estimated at two liters per day.

With this figure for vaporization at hand, water for urine was the next problem. The amount available should be sufficient to permit the kidneys to excrete waste materials presented to them without having to work at their maximum capacity. For the sick surgical patient we believe this to be an output of at least 1,500 c.c. of urine daily.

This volume was selected purely on a consideration of kidney function. Lashmet and Newburgh determined the excretory capacity of kidneys of various concentrating ability, and the following figures on the minimum amount of water needed to excrete 35 gm. of waste materials, an average daily amount, were calculated from their data:

Maximum Concentrating Kidney Ability.	Sp. Gr. of	Minimum Amount of Water Required to Excrete 35 gm. of Waste Materials
Normal.	1.032—1.029	..... 473 c.c.
Diseased.	1.028—1.025	..... 595 c.c.
	1.024—1.020	..... 605 c.c.
	1.019—1.015	..... 850 c.c.
	1.014—1.010	.....1439 c.c.

From these figures it is evident that an individual with normal kidneys needs to excrete about 500 c.c. of urine a day for normal function. With an output of urine appreciably less than this, retention of waste materials can be looked for, and the blood non-protein nitrogen will generally be found elevated. With diseased kidneys, more than 500 c.c. of urine daily is needed. In instances of the most severe renal damage, where the kidneys can concentrate urine to a specific gravity of only 1.014 to 1.010, the figures show that close to 1,500 c.c. of water is required to excrete the daily wastes. A minimum output, then, of 1,500 c.c. of urine daily by all sick surgical patients insures normal kidney function, and this is the amount allowed for urine in our estimations of water requirements.

Frequently abnormal losses of fluid have to be considered in the water exchange of the sick surgical patient. Blood, vomitus, drainage from intestinal and biliary fistulæ, diarrhea, massive exudation from inflamed surfaces, and sometimes sputum may carry away important amounts of water and materials from the body. Such losses are "absolute losses" in that they carry out no physiological function and take water that is needed for normal processes. The amount of the abnormal losses, such as vomitus, drainage from intestinal and biliary fistulæ, and sputum should be measured by the nursing staff and recorded on the patient's record.

To summarize, a calculation of the amount of water to be given daily to maintain the normal body fluids of a surgical patient who, because of his disease or treatment, is unable to take food or fluid by mouth would be as follows:

1. Water for vaporization .....2000 c.c.
2. Water for urine .....1500 c.c.
3. Abnormal losses of water—vomitus, etc...———
Total .....3500 c.c.

If the patient is taking some fluid by mouth that amount can be deducted from the 3,500 c.c. total. If abnormal losses are occurring, they should be added, since with a failure to do so the seemingly sufficient 3,500 c.c. total may be

entirely inadequate. The resulting poor urine output in such instances is often erroneously attributed to a reflex or toxic suppression of kidney function, whereas the real fact is that the surgeon did not supply the patient with enough water. There are many causes of anuria, but no others should be considered until the water exchange of the few previous days has been checked over and dehydration as the etiological factor eliminated.

Water Balance of the Dehydrated Patient

Patients who enter the hospital in a dehydrated condition present an additional problem in water balance. An amount of water sufficient to maintain body fluids is not enough for them, but an additional amount is necessary to restore the body water previously lost. If one knew how much fluid had been previously lost, water for its restoration could be given in a quantitative fashion similar to water for the maintenance of body fluids. There are no quantitative tests to show the degree of dehydration, so the only answer to the problem seemed to be a determination of the amount of water individuals need to lose in order to show the common clinical signs of dehydration, and to provide that amount of water when patients are seen with those signs.

To furnish data in this regard two normal subjects were dehydrated by withholding water until the beginning signs of serious dehydration appeared: a dry hot skin, a dry tongue, sunken eyes, a little fever, and a urine output insufficient to excrete the normal waste materials. This last finding was the only readily measurable sign and was used in this way that the dehydration of both subjects was continued until their blood non-protein nitrogen had increased to a little above 40 mg. per 100 c.c. When this occurred all of the common clinical signs of dehydration mentioned were well established. As evidence of the adverse conditions under which the kidneys were working, the urine of the 26 year old subject finally reached a specific gravity of 1.041 and contained a trace of protein and more than the usual number of casts and erythrocytes.

The water balance data of both subjects showed that the signs of serious dehydration produced were the result of being depleted of an amount of water equal to approximately six per cent of their body weight. Observations by several members of the investigating staff during the past three years support the opinion that when the signs of serious dehydration are present in a patient, body fluids of at least the same proportion have been lost. The following figures show what this amounts to for individuals of various weights:

	6 per cent
10 kg—22 lbs.	600 c.c.
20 kg—44 lbs.	1200 c.c.
60 kg—132 lbs.	3600 c.c.
80 kg—176 lbs.	4800 c.c.

The volumes cannot be really looked upon as a reserve of fluid, since beyond the first few hundred cubic centimeters they are given up with increasing reluctance and to the detriment of the whole organism. For children the relatively small amount of fluid that represents the six per cent of the body weight probably accounts for the rapidity with which, under adverse conditions, they become sick and dehydrated.

When water was again given to our experimental subjects the urine volume did not immediately increase, but nearly all of the first day's water was retained to replace the body fluid previously lost. It was perfectly apparent that the major need for water was to restore to normal some of the internal chemistry that had been upset during the dehydration period. Water to relieve dehydration, the same as water for vaporization, seemed to be a "preferential process" over water for kidney function, and it was only when the former had been cared for that sufficient water became available to the kidneys.

A calculation, then, of the amount of water to be given during the first 24 hours to a 60 kg patient who shows the beginning signs of serious dehydration would be as follows:

1. Water for vaporization	2000 c.c.
2. Water for urine	1500 c.c.
3. Abnormal loss, if any, during the 24 hours	.....
4. Water to restore depleted fluids 6% of 60 kg.	3600 c.c.
Total	7100 c.c.

This is a lot of water but studies by us on several dehydrated patients have shown that such quantities are necessary to provide water for kidney function. Of course, once the depleted fluids have been taken care of, much less water is necessary to maintain normal fluid exchange.

Parenteral Fluids

So far, the quantity of fluid to be given parenterally in order to maintain body fluids or treat dehydration has been considered. The kind of fluid to give also merits discussion.

Recently the reasons for the use of parenteral fluids in 100 general surgical patients at the University Hospital were analyzed. It was found that in 80 per cent of the cases such fluid was given simply because through the disease or treatment the patient was unable to take sufficient water and food by mouth to maintain a normal balance. These patients had not been vomiting and had not lost sodium chloride. What they needed was water and sufficient dextrose to prevent ketosis. This can be supplied best by a solution of five per cent dextrose in distilled water. The dextrose is rapidly oxidized and the water is left available for all purposes. There is no reason to give a salt solution in such instances and some harm possible, since with excess sodium chloride edema will develop in some patients. This is not an idle warning. In a recent study of the water exchange of thirteen sick surgical patients receiving saline solutions intravenously, twelve of them retained appreciable amounts of water, one developing gross edema of the ankles.

Twenty per cent of the 100 analyzed cases had been vomiting and needed some sodium chloride besides water and dextrose. Physiological saline solution or Ringer's solution is needed here, but not too much of it. Patients with a considerable loss of gastro-intestinal secretion should have a blood chloride and a carbon-dioxide combining power study done to show the depletion of chloride and sodium ions respectively. These studies should be repeated every two days while the salt solution is being given, so that it can be stopped when these electrolytes are up to normal. Since the loss of one of these electrolytes is usually greater than the other and the replacement of one is therefore needed more than the other—chlorides in alkalosis and sodium in acidosis—it is desirable to alternate the saline solution liter for liter with five per cent dextrose in water during the correction period. This provides an immediate excess of water, and with this the kidneys can generally be relied upon to excrete the less needed electrolyte. Alkalosis and acidosis can thus be taken care of with the same solutions.

When the loss of electrolytes, as by vomiting, has been only moderate and blood chemistry studies are not considered to be needed, it is a satisfactory procedure to give parenterally an amount of physiological saline or Ringer's solution equal to the amount of vomitus. The concentration of sodium chloride in these salt solutions is always greater than that in the vomitus or other gastro-intestinal tract secretion. With such a plan the electrolyte loss is well taken care of, and the mistake of giving close to 30 gm. of sodium chloride (the amount present in 3500 c.c. of physiological saline or Ringer's solution) to cover the 5 gm. loss of this material in a liter of vomitus is avoided.

In preparing the intravenous solutions under discussion it is preferable not to make up the dextrose solution with physiological saline or Ringer's solution, since its use always entails the giving of sodium chloride whether it is needed or not. To provide water and food, and this is what most of the patients need, reliance should be placed on 5 per cent dextrose in distilled water. A salt solution, probably best as Ringer's solution, should only be used when sodium chloride is needed.

Concerning the rate of administration of intravenous fluids, in our hands a flow of not faster than 500 c.c. per hour has been satisfactory. The possibility of overloading the heart with such a rate is negligible. The intravenous method, using a 700 c.c. containing bottle and a drip tube, has been preferable to subcutaneous infusions of parenteral fluid. With a little thought for the comfort of the patient intravenous fluid can be administered during the day, and night-time left undisturbed for rest and sleep.

There are many questions on water exchange and parenteral fluids that have not been answered in this paper. I have presented material on only a few of them. There is no doubt but that a quantitative consideration of the water balance of the sick surgical patient is an important part of pre- and post-operative care, and its skillful handling makes for successful results rather than failures.

CYSTICERCOSIS OF THE CENTRAL NERVOUS SYSTEM*

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OF THE platyhelminthes, tenia solium, the pork tapeworm, is of the greatest interest to the neurologist because of its faculty for invading the central nervous system in the vesicular stage. The chief host of the larva or cysticercus of tenia solium (cysticercus cellulosæ) is the pig. However, in estimating the clinical importance of the pork tapeworm, we must recall that man may harbor not only the adult worm, but also the larvæ, which readily reach the human digestive tract in drinking water, upon unwashed vegetables and in food contaminated in its preparation. These larvæ then spread throughout the body and thus endanger the life of the host. The cysticerci, given an opportunity, develop rapidly in man, involving muscles of the face, tongue, neck, breast, back, abdomen, diaphragm, and of the extremities, the pancreas, the spleen, the kidneys, the lungs, the larynx, the pleura, the heart, the liver, and the brain (Jacobsohn,[17] Hebold,[14] Delore and Bonhomme[4]). They seem to have a predilection for the nervous system where they are found in the meninges, in the ventricles and within the substance of the brain itself. The extensive dissemination through the central nervous system produces confusing clinical pictures and renders the correct clinical diagnosis very difficult.

Due to the improvement in sanitation and hygiene, cases of infestation by the tenia larva have diminished in number until at present they have become, especially in this country, what amounts to a medical curiosity. Cases of cerebral involvement are particularly rare. Since these cases do present an interesting diagnostic problem, a report of such a case together with a review of the literature of cysticercosis of the nervous system seems warranted.

The first cases of cerebral infestation with cysticercus cellulosæ were reported by Virchow[38] in 1860. He studied two cases in which the vesicles invaded not only the meninges but also the brain substance. The author was in doubt, however, whether they were parasitic or neoplastic in origin. In 1882 Zencker firmly established the parasitic origin of these cysts by finding the larval embryo and comparing them with the adult scolex. Since that time numerous cases of central nervous system involvement by the cysticercus have been reported (Delore and Bonhomme,[4] Marchand,[23] Guillian, Bertrand and Thurel,[11] Chotzen,[3] Kocher,[19] Kufs,[20] Mennicke,[24] Schob,[35] Klob,[18] Schütz,[36] Schenk,[34] Fischer,[8] Pförringer,[28] Merkel,[25] and others).

Ferber[7] in 1862 reported twelve cases. Of these, six showed no symptoms of epilepsy, while the rest had signs of a diffuse encephalitic process or of cerebral irritation.

Sato[33] collected all the cases of cysticercus infection of the brain published up to 1914. He found 128 to which he added four of his own. He found that 76 per cent of the cases were in men and that two-thirds of them occurred between the ages of forty and sixty years. In nineteen there were no symptoms at all suggestive of the infestation.

Bollinger[2] in 1888 and Hammer[12] in 1889 each reported a series of cases in which no neurological findings suggesting cysticercus infection were present.

Wollenberg[42] in 1905 reported six cases varying in age from twenty-five to fifty-eight years. In no case were larval heads found within the vesicle. Diagnosis in each case was made at postmortem.

MacArthur[22] published a report in 1934 in which he observed that many cases of epilepsy among English soldiers were evidently due to cysticercosis of the brain. Of seventy-one such cases collected from English Army records by Dixon and Smithers[5] over a period of forty years, sixty-five were in soldiers, two in wives of soldiers, one in a sailor, and three in children of soldiers. Most of the soldiers had been infected in India.

In most cases of cysticercosis, the diagnosis is not made until autopsy. Occasionally, however, cyst walls are obtained through a spinal needle, revealing the nature of the infection. Hart-

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mann[13] and Stertz[37] both obtained such membranes during routine spinal puncture and were able to make a clinical diagnosis of cysticercus infection of the central nervous system. We also were fortunate to obtain cyst pellicles from the spinal fluid which aided us in making the clinical diagnosis in the present case.

A few cases of cysticercosis have been reported in which the spinal cord or cerebellum have been involved (Geelvink,[9] Richter,[30] Westphal,[40] Hirt,[16] Meyer,[26] Henneberg,[15] Rosenblath,[31] Redalie[29]).

Wilhelm[41] in 1867 and Hebold[14] in 1884 each published cases in which the cysticercus infection had extended into the tissues of the cerebellum. In neither were definite clinical signs of cerebellar involvement present.

Most of the cases of cysticercosis of the nervous system have been reported in foreign languages, only a few being found in English (Dixon and Smithers,[5] MacArthur,[22] Luney,[21] Walton,[39] and Dolgopol and Neustaedter[6]). Because of the paucity of reports of this interesting condition in the American literature, and particularly because a clinical diagnosis was made in this case antemortem, a review of our case seems permissible.

Case Report

Mrs. S. V., aged thirty-nine, was admitted to the Minnesota General Hospital on April 26, 1935. Unfortunately the clinical history is lacking in many details, since the patient was brought to the hospital in an advanced stage of the disease and was not able to coöperate or answer questions. This history was obtained from the husband, who had been acquainted with the patient for only thirteen years. At the time he first met her, he says she had some difficulty in walking, moving about with a peculiar unsteady and shuffling gait although she had no difficulty in walking in the dark. Her memory at this time was very poor and she would forget what was told her quite promptly.

In 1929, the patient was slightly injured in an automobile accident, and from that time on she complained of transient attacks of stiff neck.

In 1930, after working all day in the garden, she suffered an attack of weakness, dizziness, and respiratory difficulty, associated with headaches. She was put to bed, where she remained for seven weeks. It is not known whether she had any attacks of unconsciousness at this time. Shortly after recovering from this prolonged spell, she began to complain of blurring of vision and generalized headaches. The headaches gradually increased in severity and duration until they would persist for hours and could not be relieved by any type of medication. The stiffness of her neck also became more marked. At about this time (five years ago), the patient began to have attacks of weakness of her extremities. Her knees seemed to give way, and she would have to lie down. She continued to do her housework and care for her children, in spite of numerous such attacks. These attacks were characterized by a definite sequence of events. They were described by the husband as follows: At the onset she developed a stiff neck followed by weakness of the extremities. She fell if she did not lie down at once. There then developed severe generalized headache with projectile vomiting and finally she lost consciousness. No convulsions occurred, the patient being flaccid. These attacks varied in their frequency, occurring at first at intervals of two months, but finally increasing to once every week.

On November 18, 1933, she visited a clinic complaining of severe frontal headache and blurring of vision. At this time her blood chemistry was normal, but she ran a definite leukocytosis. Physical examination revealed numerous large polypi in her nose. These were removed. Examination of her fundi revealed a blurring of the right disc.

The attacks continued and the patient's vision decreased very rapidly until she could no longer read. She was examined at another clinic on October 15, 1934. At this time the physical examination was essentially negative. Her blood pressure was 144/90. Fundus examination showed discs of light color, the right rather pale temporally. Laboratory tests were essentially negative. X-rays of the head showed the sella enlarged and deepened, and scattered miliary calcified areas over both sides. After a complete neurologic examination a diagnosis of a diffuse encephalitis with mental deterioration and Jacksonian epilepsy was made.

From this time until the time of admission to the hospital she went downhill. She became totally blind, disoriented, developed paralysis of her extremities, and finally lapsed into a semi-stuporous condition.

On admission April 26, 1935, complete examination was absolutely impossible, since the patient cried out with pain on the slightest movement and would not coöperate. Her pupils were equal and reacted sluggishly to light. It was impossible to test visual fields. Ophthalmoscopic examination revealed bilateral choked discs measuring from three to four diopters. There was one hemorrhage about three disc diameters to the nasal side of the left disc. The examination of the rest of the cranial nerves was indefinite. The chest and abdomen were entirely normal. The deep reflexes were normal in all the extremities. The abdominal reflexes were normal, as were also the Babinski sign. Her neck was very stiff. It was impossible to test coördination or sensation because of the inability of the patient to coöperate.

Laboratory studies revealed a 77 per cent hemoglobin, 15,000 leukocytes, of which 87 per cent were polymorphonuclears and 13 per cent lymphocytes. The urine examination was normal. Urea nitrogen and fasting blood sugar were also normal. The blood Wassermann was negative on two occasions.

During her stay in the hospital she lay very quietly and resisted any attempt to turn her head or move her extremities. Her neck was very rigid, and the Kernig's sign was positive bilaterally. Her deep reflexes became reduced and she developed bilaterally positive Babinski signs. One was occasionally able to penetrate the patient's sensorium with simple commands.

Fig. 1. X-ray of skull. Note the sharply demarcated calcified nodules scattered throughout the brain substance.

Neurological examination two weeks after admission revealed many changes. The choked discs had disappeared and were replaced by optic atrophy. The deep reflexes in the upper extremities were present but reduced, while those in the lower limbs were entirely absent. No abdominal reflexes were obtained, and the Babinski sign was positive only on the right side. Her neck still was very stiff.

The patient during this entire time had urinary incontinence and she developed a large decubitus over the sacrum. Repeated spinal drainages were performed in an attempt to relieve the intracranial pressure. Under this treatment the patient seemed to improve slightly and responded somewhat to questioning. Examination at this time showed intact superficial and deep sensation, good coördination in performing the finger-to-finger and finger-to-nose tests, and normal cranial nerves with the exception of the visual loss.

In spite of the continued spinal drainages the patient again lapsed into a stuporous state. Her decubitus ulcers failed to respond to treatment and she developed new areas of necrosis on the slightest pressure. Her temperature, which was normal on admission, rose gradually to 103° F. and the pulse to 120. She expired after a hospital stay of forty-eight days.

X-ray studies were made of her skull shortly after her admission to the hospital. These showed multiple calcified densities scattered diffusely throughout the brain (Fig. 1). No evidence of calcification of abnormal character was observed in any of the extremities. The significance of these X-ray findings was not at first appreciated.

Fig. 2. Histologic section through a cyst wall showing its division into three layers. The cuticle is quite definite and thrown into numerous papillary folds. The inner two layers are not so clear cut. The parenchymatous layer contains the numerous nuclei, while the innermost reticular layer consists of loose connective tissue.

Shortly after her admission, a spinal tap was performed. Upon removing the stylet from the needle a few drops of cloudy fluid were obtained. The stylet was re-inserted and again removed. A sudden gush of cloudy fluid occurred which again stopped suddenly. The stylet was again inserted and removed, and each time a gush of spinal fluid resulted. During one of these sudden gushes of spinal fluid, a thin translucent whitish membrane floated out of the needle into the spinal fluid where it opened to reveal an almost intact vesicle. Histologic studies of this pellicle revealed a definite cyst wall (Fig. 2). It was the combination of the x-ray findings of the skull plus the peculiar cyst walls in the spinal fluid that led us to the diagnosis of cysticercus infection of the central nervous system, although cysticercosis was offered as a probable explanation of the x-ray picture before the spinal tap. Many large cysts and fragments of cysts were obtained in the frequent spinal taps (Fig. 3a). These were identified as the walls of the cysticercus of the pork tapeworm by Dr. W. A. Riley, Professor of Entomology and Economic Zoology at the University of Minnesota. We would like to acknowledge the kind assistance and stimulating interest of Dr. Riley in this study.

The cell count in the spinal fluid varied from 65 to 8,800 leukocytes, the majority being polymorphonuclears. The spinal sugar varied from 8 to 78 mg. per cent, and the protein from 40 to 125 mg. per cent. Serologic tests for syphilis on the spinal fluid were inconsistent. At no time were eosinophiles found in the spinal fluid, although as high as 6 per cent eosino-

philes were observed on routine blood studies. Examinations of the patient's stool for tapeworm or ova were repeatedly negative.

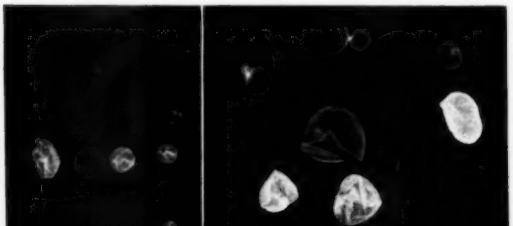

Fig. 3. (a) Cyst walls obtained through the spinal needle. Note the variation in size. (b) Cyst walls obtained at postmortem from the ventricles. They resemble quite closely those obtained by spinal puncture. In the upper part of figure are two cysts from which daughter cysts have budded off.

Autopsy Studies

The postmortem study revealed a well developed white female weighing about 135 pounds. There were multiple decubitus ulcers: one on the lateral aspect of the left heel, 1 cm. in diameter; one on the crest of the left ileum, 2 cm. in diameter; in the region of the left greater trochanter, one 3 cm. in diameter; and one over the sacrum, measuring 7x4 cm.

The peritoneal, pleural and pericardial cavities were all normal. There was a slight amount of patchy consolidation of the left lower lobe and of the right upper and lower lobes of the lungs.

The gastro-intestinal tract was normal.

The rest of the organs with the exception of the central nervous system were negative both grossly and microscopically.

The scalp and calvarium were normal. On removal of the skull, the dura was found to be quite tense. The anterior surface of the brain was lifted upward in order to expose the tentorium. The temporal lobes were adherent to the lesser wing of the sphenoid by soft easily separated adhesions. The floor of the third ventricle bulged downward and was adherent to the sella turcica. In an attempt to separate these structures, the floor was torn and a large amount of turbid fluid gushed forth, filling the skull and running over upon the table, revealing that a marked hydrocephalus was present. This turbid fluid contained many cysts of varying size and shape (Fig. 3b). Some were smooth walled, transparent, and contained a clear, watery fluid, while others were thicker walled and yellowish, and were filled with somewhat gelatinous material. Most of the vesicles were single, but many contained numerous outpouchings, the so-called daughter cysts, connected to the main vesicle by fine thread-like processes. It was because of this grape-like appearance of the daughter cysts that the name, "cysticercus racemosus," was suggested for this condition by earlier workers. None of the cysts contained larval scolices although many did present a tiny rounded yellowish nodule on their inner surface, probably the rudiment of a previously existing head. The vesicles were of the same gross appearance as those obtained through spinal drainage.

Fig. 4. Drawing showing a coronal section through the brain. Note the granular appearance of the ependyma, the dilatation of the ventricles, the softening of the corpus callosum, and the large calcified cysticerci in both sylvian fissures.

On removal of the brain, an extensive soft opaque membrane was found covering its entire base. The membrane extended anteriorly to the under surface of the frontal lobes involving the optic nerve and chiasm as well as the internal carotid arteries. The membrane also covered part of the temporal lobes. It extended along the middle cerebral artery deep into the Sylvian fissure, the temporal and frontal lobes being firmly bound together. Posteriorly the membrane covered the inferior surface of the occipital lobes, extending to the cerebellum, and to the pons, where it enmeshed the basilar artery and its branches. It also extended down the medulla into the spinal cord. Besides the imbedded nerves and vessels, the membrane contained many smooth elongated strands which appeared as whitish membranes or as compact yellowish masses. These whitish membranes represent cyst walls that have become compressed and incorporated in the thickened membrane. It seems that well developed, well shaped cysts are found only free in the ventricular system, while those in the membranes and brain tissue are compressed and deformed.

In the posterior portion of the left middle frontal convolution was a depressed area in the brain measuring 2x2 cm. and filled with a large multilocular cyst. This cyst was yellowish in color and contained cloudy material. Most of the cyst separated easily from the cerebral depression, being attached only by a long thread to the anterior part of the cavity. The cyst histologically revealed the typical structure of a cysticercus vesicle wall. In one region of the vesicle there was a large calcified nodule evidently representing the orig-

inal scolex. The cerebral cortex directly underlying the cyst was compressed.

On the medial aspect of the left cerebral hemisphere in the lobulus paracentralis there was a small calcified nodule situated within the brain substance but extending to the surface. This nodule measured 3x4 mm. and on cut section was found to extend 4 mm. into the brain tissue. A similar nodule was found in the right inferior frontal convolution.

Coronal sections a few millimeters in thickness were made of the entire brain. The sections revealed a marked internal hydrocephalus involving all the ventricles, the block evidently being due to occlusion of the foramina of Luschka and Magendie by the thickened membrane. The lateral ventricles were equally distended and their anterior and posterior horns reached nearly to the surface of the brain. The third ventricle was enlarged to almost three times its normal size. The distention caused marked thinning out of its floor.

The ependyma lining all the ventricles was thickened, granular, and softened (Fig. 4). Its inner surface was covered by a uniform layer of tiny velvety tubercle-like projections. In some regions, the thickened ependyma was completely freed revealing the glistening surface of the underlying brain tissue. The choroid plexus was thickened and covered by numerous tiny clear-walled cysts. Many tiny specks of calcification were scattered throughout the plexus. No free cysts were found within the ventricular system, these apparently having escaped during the removal of the brain.

The white substance of the left cerebral hemisphere was much softer than that of the right. This softening was scattered throughout the hemisphere, but was most marked in the basal ganglia and the subthalamic region, extending to involve the mammillary body and the infundibular areas. The corpus callosum on the left side was also softened, edematous, and boggy in appearance (Fig. 4). This peculiar change was most marked in the region of the body of the corpus callosum and merged into normal tissue as one approached the splenium. This edema was not restricted to the corpus callosum, but extended into the gyrus cinguli, apparently obliterating the sulcus. In the motor regions, the brain tissue again assumed a normal appearance. Histologically the extensive gross changes in the left hemisphere and in the corpus callosum showed surprisingly little. The microscopic appearance was that of an intensive edema with separation of the brain tissue by clear spaces and by large spaces around the blood vessels. There was no evidence of tissue destruction or of a cellular reaction which might be considered indicative of an inflammatory or reparative process. The cerebral cortex was uninvolved.

Calcified or partly calcified nodules were observed scattered throughout the brain and meninges. There seemed to be no predilection for any particular region since they were found in the basal ganglia, the internal capsule, the hypothalamic region, and throughout the various parts of the cortex, the white substance, and the cranial meninges. None were seen in the pons, the medulla, or in the cerebellum. The nodules varied in size from a few millimeters to over one centimeter in diameter. Most of those in the brain substance appeared to be single, while those in the meninges were

Fig. 5. Photograph of the spinal cord. Note the large number of flattened cysticerci vesicles situated all along the cord and extending with the spinal nerves through the dura. Two of the swollen hemorrhagic spinal ganglia can be seen.

frequently multiple and clumped. Occasional nodules were observed which had extended from the meninges into the brain substance and had involved both tissues.

In the brain, the cortex and white substance were about equally involved. The meningeal nodules were most frequent in the region of the Sylvian fissures, and around the optic nerve and the optic chiasm. The Sylvian fissures were widened throughout their extent and filled with a thickened membrane in which numerous nodules were imbedded, as many as ten being counted in a single section. In the anterior part of the Sylvian fissure just below pars triangularis of the inferior frontal gyrus, were two large nodules, each measuring fully one centimeter in diameter (Fig. 4). These were firmly imbedded in the thickened meninges.

All the meningeal nodules were surrounded by a dense layer of connective tissue. Many displaced or indented the underlying brain substance. The nodules differed in consistency, some being hard and gritty while others were soft and almost fleshy. They varied in color from deep yellow to pearly white, the latter being the hardest. Most of the nodules had a lamellated appearance. The softer yellowish ones appeared stringy in the center and were surrounded by spongy

whitish tissue. All were enveloped either by a firm meningeal layer or by a thin zone of cerebral tissue. There was no softening of brain tissue observed about any of the nodules.

In the meninges, the numerous vessels in the neighborhood of the nodules appeared uninvolved unless the vessel passed through the hyalinized mass, as, for example, did the middle cerebral on the left side.

The spinal cord grossly presented irregular thickening of the leptomeninges, more marked on its posterior surface. Attached to the inner surface of this thickened membrane were numerous groups of flattened whitish elongated membranes representing confluent groups of tiny cysts (Fig. 5). These flattened bladder walls were usually situated on the lateral aspect of the cord, and contained many small calcified plaques of varying size. In the region of the thoracic cord the cysticerci vesicles were most extensive. Some covered an area extending over three to four cord segments. An occasional cyst filled with a tiny amount of clear fluid was observed.

The dura separated easily, the subdural space being uninvolved except in the region of exit of the spinal nerves. Almost all of the spinal nerves were surrounded by prolongations of the parasitic vesicles which followed the nerves as they passed through the subdural space to the spinal ganglia. Most of the ganglia were swollen to twice normal size and were adherent to the surrounding tissue (Fig. 5).

When the subarachnoid space was exposed, numerous small intact vesicles with transparent walls were observed floating free in the subarachnoid fluid. This probably was the source of the cysts obtained on spinal drainage. Many cysts were found in the region of the cauda equina.

The cord itself, especially on its anterior aspect, presented three areas of enlargement and softening. The first involved an area from the fourth to the sixth thoracic cord level. Grossly the cord on cut section appeared softened and edematous. The normal cord arrangement was entirely destroyed. The second enlargement was at the tenth thoracic level. Here the swelling was one centimeter in length and the tissues were not as soft as in the upper lesion. The normal arrangement of cord substance was only partially wiped out. One was still able to identify the white from the grey substance. The lowest of the cord bulgings was in the region of the first lumbar segment, where multiple tiny nodules protruded from the cord surface. The tissue throughout this region was soft but not necrotic.

Histological Studies

Meninges.—The membrane at the base of the brain varied greatly in thickness in various regions, being greatest in the Sylvian fissure and in the region of the Gasserian ganglion. Here it was very cellular and fibrous, while in other regions it was thin and contained few cells. The membrane was composed of a meshwork of loose connective tissue fibers containing numerous elongated spindle-shaped cells whose processes gradually merged with the surrounding tissue. These cells contained vesicular nuclei with clumped chromatin particles. In most regions this connective tissue, which seemed to form the framework of the membrane, was quite loose, having an almost reticular appearance. Interspersed within this connective tissue membrane were many cells of a mononuclear type consisting of lymphocytes, monocytes, plasma cells, and occasional giant cells. As a rule the cellular element was not prominent, but in certain regions, especially around the large vessels and in the Sylvian fissure, the cells were so numerous that the intercellular tissue could not be made out.

In some regions small clumps of red blood cells were observed within the membrane. In the Sylvian fissure, there were numerous phagocytes filled with dark brown particles, evidently hemosiderin granules from phagocytosed red cells.

The membrane also contained large hyalinized and calcified masses. These represented parts of cysticerci and will be discussed presently.

Structure of the Cysticercus Membrane.—Histologically the structure of the walls of the cysts found lying free in the subarachnoid space was quite consistent. These vesicle walls contained two or three layers. The outermost or cuticular layer consisted of a well demarcated homogeneous structure presenting numerous blunt papillary elevations which resembled roughly the elastica interna of a large muscular artery (Fig. 2).

The rest of the cyst wall consisted of a meshwork of thin fibers forming a plexus-like arrangement. Most authors describe this inner layer as consisting of two separate strata with indistinct boundaries. The middle layer (parenchymatous layer) consisted, therefore, of a groundwork of loose connective tissue which penetrated into the papillæ formed by the folds of the cuticle. The inner surface of this indefinite middle layer contained a fairly uniform row of thickly placed small dark cells (Fig. 2). This parenchymatous layer gradually merged with the innermost or reticular layer, which consisted of a loose network of interlacing fibers, and contained only an occasional cell.

In some cysts there occurred a proliferation of the cells of the parenchymatous layer to form a large clump or nodule of cells. The proliferating cells invaded and replaced the reticular tissue and penetrated the bladder lumen. Apparently this represented the remnants of a degenerating scolex or early arrested formation of the scolex.

In many of the larger cysts, the papillæ enlarged and became constricted off to form smaller daughter vesicles which remained attached to the original cyst, resulting in a racemose appearance, hence the name cysticercus racemosis.

Structure of Cysticerci Within Brain or Meninges.—The cysticerci enmeshed in meninges or located within the brain tissue had a different appearance from those lying free in the ventricular system. They seemed to have become altered due to compression and degeneration.

The cysticerci within the meninges were all hyalinized; in none was any structure of the scolex discernible. Numerous calcium particles were deposited in certain areas of the hyalinized mass and probably represented the calcified scolex, which usually is the first structure

Fig. 6. Histologic section of a calcified cysticercus situated within the sylvian fissure. No structural details can be made out. There is a dense connective tissue wall surrounding the parasite. The vessels within the vicinity are normal.

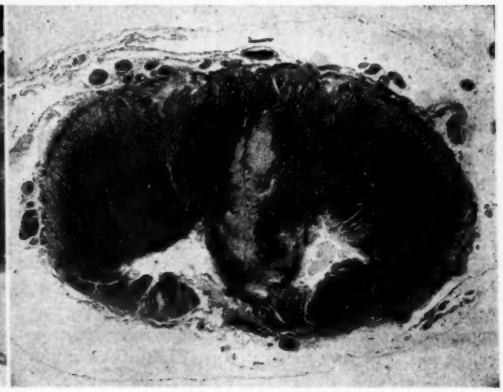

Fig. 7. Section through the thoracic cord. Note the large cavities replacing most of the anterior horns. There is a partial destruction of the medial portion of the posterior horns.

to undergo degeneration. The cyst walls were completely hyalinized (Fig. 6). Surrounding this hyalinized bladder-wall was a dense wide layer of collagenous connective tissue. No cells were present within this tissue although an occasional small nucleus was observed. In a few instances there were patchy areas of hyaline degeneration within this fibrous tissue. Surrounding this latter layer there was a much looser layer of connective tissue filled with numerous mononuclear cells and many blood vessels. This loose connective tissue usually merged with the elements of the surrounding membrane. Around those nodules that were in contact with the brain, a thin layer of glia tended to accumulate on the border of the nodule, thus forming still another layer outside of the loose cellular connective tissue.

Many parasites that had invaded the brain substance had capsules similar to those in the meninges. Others, however, were not surrounded by layers number three and four. These degenerating cysticerci were covered only by a thick layer of glia containing few or no cell nuclei.

Vessel Changes.—Contrary to the findings of numerous authors, the vessels within the brain and meninges showed little or no changes, regardless of whether they were in contact with a degenerating cysticercus or not. A few small vessels within the meninges showed in their adventitia numerous round cells. The intima and media were not involved. With the exception of the middle cerebral artery, all the large arteries at the base of the brain were normal in structure. The middle cerebral artery as it lay in the Sylvian fissure was firmly imbedded in the inflammatory membrane described above, and was in contact with a hyalinized cysticercus. This vessel showed a uniform thickening of the intima and a definite reduplication of the elastica interna. Between the two layers of elastic tissue there was a large amount of muscle and connective tissue fibers. The adventitia showed a moderate increase in its collagenous fibers which gradually faded out into the surrounding tissues. The intracerebral vessels showed no change.

Askanazy[1] was the first to describe the vessel changes in cysticercus meningitis. He concluded that the large vessels at the base of the brain were mostly involved. Goldstein[10] described the vessel changes as of two types: in the first there occurred a massive non-cellular thickening of the intima with a reduplication of the elastica and an invasion of the adventititia by numerous cells. In the second type of change there occurs an invasion of the intima by numerous cells, while the adventitia is thickened and only moderately invaded by cells. Numerous other vessel alterations have been reported, such as medial thickening, vessel wall necrosis, reduplication of the elastica interna, fragmentation of the elastic interna, destruction or thinning out of the medial musculature, replacement of the media by collagenous fibers, etc. The lack of these changes in our case, that of a fairly young individual, makes one wonder whether most of the vessel alterations reported may not have been due to the age of the patient and not to the specific invasion of the cysticercus cellulosæ. All of these changes may occur as age changes in cerebral vessels.

Ependymal Changes.—The ependyma lining all the ventricles showed a granular ependymitis (Fig. 4). It showed a peculiar nodular appearance on gross examination. Histologically the ependymal surfaces contain numerous nodular elevations consisting of dense masses of glial tissue (Fig. 7). The fibers within these nodules merge with the underlying brain tissue from which they appear to arise. They are relatively poor in nuclei and stain somewhat deeper than the surrounding brain tissue. In most cases there was no ependymal lining over the nodules, although occasionally the epithelium did extend part way up their sides.

Cord Changes.—In studying the cord, sections were taken from the cervical, mid-thoracic, and lumbar regions.

The cervical cord showed no striking pathologic changes. The nerve rootlets were normal. The cord was surrounded by an inflammatory membrane consist-

ing of numerous mononuclear cells, many of which possessed a large amount of granuar cytoplasm. Within this membrane covering the posterior surface of the cord was a partly degenerated elongated cyst filled with necrotic caseous material. The vessels within the meninges were not involved in spite of the surrounding inflammatory tissue.

The thoracic cord showed much more extensive changes. In its anterior portion, replacing most of the anterior horns and also some of the surrounding cord tissue, were two large, triangular, rather symmetrical cavities (Fig. 6). An occasional nerve cell could be seen in the remains of the anterior horns. The cells in Clark's columns were present but showed complete chromatolysis and beginning shrinkage of the cell bodies. There was extensive demyelinization of the medial portions of the posterior columns and of the entire anterior columns. The rootlets, both anterior and posterior, were intact. There was a meningitis here similar to that at higher cord levels. The inflammation was most extensive on the anterior surface of the cord.

The upper lumbar segments showed partial replacement of the right anterior horn by a small cavity. Evidently this cavity had dissected down from the higher levels. It did not reach as far on the left, leaving the left anterior horns quite intact in the lumbar cord. The anterior horn cells still present were of normal size and shape, but showed partial chromatolysis. No myelin sheath changes were seen. The meningitis was very severe in the lumbar cord, especially on its posterior surface, where the inflammatory membrane surrounded the rootlets and even invaded the perineural tissue. The nerve fibers were, however, not involved. On the anterior aspect of the cord, there was a large hyalinized vesicle which was loosely attached to the meninges.

The lower lumbar segments showed moderate demyelinization of the posterior columns, the rest of the cord being intact. The rootlets showed a moderate proliferation of the Schwann cells. Most of the nerve fibrils were still intact. The meningitis here was slight.

Discussion

On reviewing the pathological involvement in our case and the various other cases in the literature, it is readily apparent that no single clinical picture can be expected in cysticercosis of the central nervous system. The widespread basilar meningitis, the high grade internal hydrocephalus, the softened areas in the brain and cord, the extensive invasion of the brain substance by vesicles, all contribute to the diversity and variability of clinical manifestations. Many cerebral cysticerci never show symptoms and are discovered only at autopsy (Jacobsohn,[17] Ferber,[7] Hammer.[12] In other cases the involvement manifests itself chiefly as a meningitis with severe headache, stiff neck, vomiting, some cranial nerve involvement, and pain upon extension of the extremities. But as a rule the clinical picture is kaleidoscopic, varying with the manner and intensity of the cysticercus invasion, the rapidity of invasion, and the changes in the neighboring tissues. The symptoms reported have varied from generalized signs of increased intracranial pressure, such as headaches, vomiting, diplopia, visual disturbances, and vertigo, to more marked disturbances such as sudden blindness, paresthesias of the face and body, paresis, urinary and rectal incontinence, epileptiform seizures, hallucinations, delirium, and loss of consciousness. Sudden and complete blindness is claimed by Rosenblath to be quite characteristic of this involvement. The extreme difficulty that faces the neurologist in arriving at a clinical diagnosis of such a case is readily apparent in reviewing the various diagnoses made antemortem in the cases reported in the literature. These include presenile psychosis, cerebral neoplasms of all locations, idiopathic epilepsy, encephalitis, luetic meningitis, tuberculous meningitis, and many more. There often occurs, as a result of the extensive cerebral damage, a nonspecific positive Wassermann reaction, which merely adds to the confusion.

It is apparent, therefore, that because of the diversity of symptoms, the neurologist usually cannot make a definite clinical diagnosis, beyond establishing the presence of an organic disease of the brain and meninges. In such cases he is then forced to seek carefully for some other aid, either technical or laboratory, that might help in arriving at the correct diagnosis. In cysticercus involvement of the nervous system there are several such aids, which when considered with the clinical picture of a rather indefinite but diffuse type of meningo-encephalitis should frequently lead to a correct diagnosis of cysticercus infection. These aids are as follows:

1. *The occurrence of cysticerci in the skin, the muscles, or in the eye.* Worms inhabiting the cutis can frequently be felt beneath the skin as freely movable nodules about the size of a pea. These cysts vary widely in a number of different cases and also in the same case from time to time. When the cysts become calcified, they often remain indefinitely as small, hard nodules. These cysts may be detected in the subcutaneous tissues and muscles of any part of the body, more especially of the head and face, lips, trunk

and limbs; the hands and fee usually escape. These nodules may be biopsied in order to verify the diagnosis. When the vesicles become calcified they may be seen upon x-ray examination of the limbs.

The bladder-worm is often found within the anterior chamber of the eyes, where it produces impairment of vision and irritation of the iris. Usually the parasites occur singly within the eye and can be detected by careful ophthalmoscopic examination. Cysticerci of the eye have been followed over a period of twenty years.

2. *X-ray studies of the skull.*—The parasites may invade the body in large numbers and yet give no outward evidence of their presence until years later when they calcify and are discovered, often accidentally, by radiological examination. Calcification occurs only later, after the death of the parasite, hence the radiologic confirmation or help is unlikely during the early period of the infection. In the brain, calcification of cysticerci is much slower and less frequent than elsewhere, so that a negative radiogram of the skull in the presence of cysticercosis is common. However, when skull plates reveal diffuse mottling of the brain with smali areas of calcification, a diagnosis of cysticercus infection must be considered.

3. *Bladder walls in the spinal fluid.*—A fairly uncommon but very convincing aid in the diagnosis of cysticercus infection, is the obtaining of vesicle walls through the spinal puncture needle. Such findings have been obtained by Stertz,[37] Hartman,[13] and by ourselves.

4. *Cyst walls obtained at operation.*—An occasional aid in the diagnosis is afforded by section obtained from the brain at operation. Pfeifer[27] obtained, through a trephine opening, some whitish tissue which proved to be a cysticercus wall.

5. *Eosinophilia in the blood and spinal fluid.*—In any case that presents a picture of an atypical meningo-encephalitis, the presence of eosinophilia in the blood or in the spinal fluid should make one suspicious of a cysticercus infection. It is true that eosinophilia may be encountered in a number of allergic somatic diseases which must be excluded. Often, in cases of long standing, there may be no eosinophilia. Nevertheless, both the blood and spinal fluid should always be carefully examined for eosinophiles. If they are increased, one must consider a parasitic infestation, viz., cysticercosis. Our case showed no increase in eosinophiles in the spinal fluid, although we did obtain as high as six per cent eosinophiles in the blood.

6. *Proglottides and tapeworm eggs in the stool.*—Every autogenous infection with cysticerci must be preceded by an infestation with the mature tapeworm, parts of which are occasionally found in the stool of these patients, thus aiding materially in the clinical diagnosis. Often, however, years elapse before the cerebral manifestations become noticeable. By this time the original tapeworm infestation may have been cured. The stool examination, therefore, would be negative in most cases, and of little aid in the final diagnosis.

7. *Serologic tests.*—The final aids in the diagnosis are the various serologic tests such as the skin test, the complement fixation test, and the precipitin test. For all of the above tests a specific cysticercus antigen is necessary and this is, unfortunately, often difficult to obtain. We were unable to obtain such an antigen in spite of numerous inquiries. The skin test and complement fixation tests have been used frequently in European countries but give positive results in but fifty per cent of cases of cerebral cysticercosis. Recently Rothfeld[32] advocated the precipitation test as a diagnostic procedure. He feels that it is more sensitive than any of the other reactions.

We were indeed fortunate in our study to have numerous of the above aids in helping us establish our clinical diagnosis. After obtaining the symptoms of a diffuse widespread meningoencephalitis, we received the roentgenologic report of numerous calcified nodules scattered throughout the brain. The report first made us suspect the cysticercus etiology of the involvement. Our suspicions were confirmed when we obtained the pellicles from the spinal fluid and studied them histologically.

Cysticercus infection of the nervous system is a rare condition. When it does occur, the neurologist should be on the watch for this condition, and will need to use all the aids available to assist him in a correct diagnosis.

Summary

1. A case of cysticercosis of the central system presenting the symptomatology of a diffuse meningo-encephalitis is reported. X-ray studies of the skull revealed numerous calcified nodules

scattered through the brain. Numerous cyst walls were obtained on spinal tap. These latter findings materially assisted the clinical diagnosis.

2. Postmortem studies revealed an extensive basilar meningitis with numerous compressed vesicles enmeshed within the membrane covering the brain and cord. Numerous calcified cysticerci were observed within the brain substance and meninges.

3. A brief summary of the literature is given.

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CAUSES, DIAGNOSIS AND TREATMENT OF HAY FEVER*

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AS EARLY as 1829, William Gordon concluded that hay fever was caused by "aroma emitted by flowers of grasses," particularly from sweet vernal grass. Charles H. Blackley, in 1873, furnished the first experimental proof that pollens are the etiologic agents of seasonal hay fever. Its prevalence, in England especially, during the haying season, pointed to grasses as the plants chiefly responsible for the malady (hence the name hay fever), but the notion began to be widespread that many other plants such as roses (rose fever), sweet peas, and goldenrod were involved.

However, William Scheppegrell (1917) was the first one to show that the *only* species of plants involved in the causation of hay fever were those producing wind-borne pollen. That is, such showy plants as roses, goldenrod, et cetera, have insect-carried pollen and are not general causes of hay fever. The importance of Scheppegrell's contribution deserves emphasis, since, when this fact was clearly recognized, it was possible to determine for any region the species concerned, and this led to the making of surveys of hay fever plants in various parts of the world. At the suggestion of several members of the State Board of Health, such a survey was prepared for Minnesota by Dr. Rosendahl. It listed the principal wind-pollinated plants, both native and cultivated, growing in the state, their geographic distribution, prevalence, and the dates of flowering. This survey did not include data as to the concentration of pollen in the air of any species at a given time or locality. For successful diagnosis and treatment of hay fever, such data are necessary and, accordingly, pollen concentration studies were undertaken and have been carried on for four consecutive years. Information has been gathered from eight separate stations within the state and five outside in the upper Mississippi valley. It appears that no more extensive collection of data concerning hay fever plants, pollens, and treatment has ever been accumulated. Especially is this true as concerns pollen throughout the entire season, for our daily records show the pollen behavior of all groups from March through November.

Methods.—Records of the pollen content of the air have been obtained by exposing an oil-coated microscope slide out of doors for twenty-four hours. Air-carried particles including pollen grains are ever settling, and some of these will adhere to the slide's sticky surface. A slide so exposed is examined with the microscope and the pollen grains observed are recorded as to kind and number of each (about sixty kinds have been found on the slides). The approximate number of pollen grains per cubic yard of air can be calculated from such counts by use of physical formulæ. Simply, these formulæ are based on the obvious fact that more small pollen grains can occupy a cubic yard of air than can large ones. The data are put on such a basis since it gives a measure of the actual conditions to which the patient is exposed—a measure which is of greatest importance in diagnosis and treatment as Dr. Ellis and Dr. Sweetser will shortly point out to you.

Discussion.—Most people realize what pollen grains are when they remember that it is the yellow or brownish substance which "powders" our noses when we smell of fragrant flowers. They are tiny spores which under favorable conditions will germinate and produce the male or sperm cells of the plant. Obviously, wind-borne rather than insect-borne pollen is of greater significance in hay fever. Typical examples of flowers producing air-carried pollen are the oak and the grasses.

Passing on to the statistics, let us consider the critical pollen concentrations of the most important hay fever plants. Time will not permit the review of all pollens present in the air.

The pollen of various trees is first to be present in the air. Soft maple, for example, may begin pollination as early as March 25. While the concentration of tree pollen becomes rather high, it

*Read in symposium on Hay Fever at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, June 4, 1936.

is fortunately true that their pollination season is relatively short. The studies of 1932 and 1933 show that April 23 represents a time when the pollen count is critically high for elm, cottonwood, and box elder; while the records for 1934 and 1935 illustrate how markedly weather conditions can affect the pollen count. Due to an erratically slow and dusty spring, the 1934 peak was delayed about a week, but with rapid increase of temperature the oak trees were encouraged to shed pollen a week earlier than usual (May 7 instead of the middle of the month). The rainy spring of 1935 caused no marked change in pollination dates, but naturally reduced the pollen count to about a third of the normal. Dr. Ellis' data will show which trees are most important from a clinical standpoint.

Grass pollen dominates the air during June and the first part of July. The days between June 5 and 15 are serious ones for persons sensitive to this group. The increasing scarcity of rain from 1932 to 1934 is very clearly reflected in the pollen counts of the grasses. In 1932, the pollen concentration was rather high; in 1933, there was a great decrease, and in 1934, the amount of grass pollen is hardly significant. The count for 1935 is rather striking, since with the reappearance of at least occasional rains we find the grasses recuperating and producing pollen much as they did in 1932 except for the appearance of a tremendously high count on June 13 (about twice as high as any recorded before). This would appear to be a very good reason why certain grass-sensitive patients suffered so markedly (perhaps even for the first time) last season.

The graph for chenopod pollen includes the pigweed group and the Russian thistle group. While there is a general similarity between the pollen counts for the 4 years, certain peculiarities are worthy of note. The period July 25 to September 15 very generally represents the time during which concentrations are seriously high. The 1935 count was of great interest since it showed abnormally high concentration during September—in fact, the peak of pollen production came on September 24. Reference to this fact will be made again in connection with the next group. If we summarize this group by calculating the seasonal totals, we see an interesting phenomenon. The count for 1934 very definitely overshadows those for the other three years. To go further, you will note that with increasing dryness there is an increase in amount of pollen. This is not strange when we recall that during 1934 all too many grassland pastures were sadly taken over by the drought-resistant Russian thistle. It was during this year that persons mildly sensitive to chenopods had their first marked trouble. With the recovery of grasses during 1935, we find a decrease in amount of Russian thistle.

Ragweeds stand supreme with respect both to pollen concentration and number of cases in which it is involved. However, the folly of considering it as the only important cause of fall hay fever will be very clear from data which Dr. Ellis and Dr. Sweetser will soon present. The pollen graphs reveal several points of interest. First, the data of all four years have shown that the middle of August finds the pollen count first attaining serious proportions. Here, then, would appear to be a very good explanation of why so many hay fever patients have their first symptoms on August 15. Further, the data demonstrate that there are, in general, three marked critical peaks of pollen production. The first occurs about August 23. The second peak at the end of August represents the highest concentration for the season. A third peak of similar proportions to the first occurs about September 10. This behavior has been consistently followed during the first three years of the survey. The year 1935, with its excessive heat, showed some striking deviations. Most serious was the attainment on August 23 of a peak quite out of proportion to any this early in the month. The suffering which it caused will be remembered by those concerned with hay fever. After this date, the count was fairly normal, becoming rather low with the advent of cooler weather during the last part of August and first part of September. Return of warmer weather on September 12 again produced an abnormally high pollen concentration which was likewise correlated with distressing hay fever symptoms. September 24 is worth noting since it shows a peak unusually high for this late date, as was true for the chenopod group which was mentioned before. Obviously, it represented a critical date for persons sensitive to both groups.

In summary of the ragweed group, we see that the seasonal totals are strikingly similar for the

first three years of our survey. The year 1935, which provided bare areas and sufficient rainfall for luxuriant growth of ragweeds, showed a total pollen count which was 50 per cent in excess of the three year average.

Finally, we come to a group which has been more or less ignored. In 1932, Dr. Rosendahl and Dr. Ellis called attention to the importance of various kinds of artemisia. Common names applied to these plants are wormwood, sagebrush, absinth, mugwort, and carpet-sage. Their pollen counts are very low as compared to the groups just mentioned. Yet, they must be considered since their pollen is consistently present in the atmosphere during July, August and September. Further, the group reaches its height of pollen production after the middle of September, thus serving to prolong the potentially troublesome season.

RESULTS OBTAINED IN TREATMENT OF HAY FEVER WITH POLLEN EXTRACTS*

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THE relief of hay fever by subcutaneous injections of pollen extracts was first attempted in 1905 by Dunbar, a physician of Hamburg. Noon's favorable report in 1911 created widespread interest in this method. Circumstances favored Noon's success in that hay fever in England is caused chiefly by the pollens of grasses. Since there is little evidence of any specific differences in the hay-fever-causing substances of the various grass plants, there is little opportunity for error in the specific treatment of grass hay fever.

If the treatment of hay fever with pollen antigen is to succeed, it must be specific. Specific treatment demands a correct and complete diagnosis of the causes for each individual sufferer. Obviously this demands an exact knowledge of the pollens which are present in the environment of the patient coincident with the occurrence of his symptoms. A correct diagnosis is impossible without a knowledge of the period or season during which each kind of pollen pollutes the air. The results of skin tests are of relatively little value unless correlated with data concerning pollen incidence and the period of symptoms of the patient. Treatment material for the individual patient must contain extracts of all pollens to which sensitivity is demonstrated when the pollination period coincides with the period of symptoms.

Much misconception concerning diagnosis and treatment has arisen through the classification of hay fever into certain types, as spring, summer, and fall. The spring type by tradition is due to the trees, the summer type to the grasses, and the fall type to the ragweed. The inexperienced is led to conclude that patients exhibit symptoms due to single causes and that they naturally fall into these types. This conception, which one finds in standard textbooks of medicine and in the literature of biological houses, does not take into consideration many important causes. Furthermore, little consideration is given to the common multiple sensitivity which wipes out such classifications as spring, summer and fall types. In a study of three hundred cases only 15.65 per cent could be so classified. In approximately 85 per cent this conventional classification is wiped out by multiple sensitization. (See Table I.)

The real truth of the matter is that the air is polluted with pollen by a succession of plant forms from the time that plant reproduction begins in the spring until this is ended by frost. No simple classification can take the place of an accurate knowledge of the air-borne pollens and the exact periods during which air pollution occurs. Thanks to the coöperation of Professor Otto Rosendahl of the Department of Botany of the University of Minnesota we now have more complete data concerning the causes of hay fever for Minnesota than have yet been assembled for

*From Department of Preventive Medicine and Public Health and Students' Health Service, University of Minnesota. Read in symposium on Hay Fever at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, June 4, 1936.

TABLE I. SEASON OF SYMPTOMS AND CAUSES FOR 300 PATIENTS

Apr. May June July Aug. Sept. Oct.	Number	Per cent	Causes
...———...	3	1.	Trees
———	2	.66	Trees
....———....	12	4.	Grass
..———.....	20	6.66	Weeds (not ragweed)*
..———.....	10	3.33	Ragweed
		15.65	Total
....———...	118	39.33	Ragweed and weeds*
....———...	71	23.65	Grass, weeds* and ragweed
..........———....	61	20.32	Trees, grass and weeds
.....——— ———.....	3	1.	Trees, weeds
	300	99.95	

*Includes chiefly members of the amaranth, chenopod, dock, and plantain groups.

TABLE II. RESULTS OF TREATMENT

Relief	Series I		Series II		Series I and II	
	Patients	Per cent	Patients	Per cent	Patients	Per cent
Complete	24	38.	33	41.2	57	40.
Marked	16	25.4	28	35.	44	30.8
Fair	10	15.9	13	16.3	23	16.
Slight	10	15.9	4	5.	14	9.8
None	3	4.8	2	2.5	5	3.4
	63	100.	80	100.	143	100.

any region on the American continent. The chief essentials of this data already published in MINNESOTA MEDICINE† properly applied renders accurate and complete diagnosis relatively easy.

Adequate Treatment

Next in importance to that of correct diagnosis the most important factor affecting results with specific treatment is that of dosage. There is no way of determining in advance of treatment the size of the dose that will be effective in an individual patient. The aim should be to create as high a state of tolerance as possible. This means the attainment of as large a dosage within certain limits as is reasonable.

Treatment Results

Knowledge concerning the causes of hay fever for Minnesota and especially the Twin Cities is now practically complete. With our increased knowledge we have increased our accuracy of diagnosis. What results can be expected with specific treatment?

Following the season of 1935 we were able to obtain reports on the results with specific treatment of 143 patients, all treated with pollen extracts prepared under our own supervision. These extracts were prepared and dispensed by the University Hospital Pharmacy. All pollens used were certified as to correctness and purity by the University of Minnesota Department of Botany.

The report concerns two series of patients. Series I consisted of sixty-three students of the University treated at the Students' Health Service. Series II comprises eighty patients treated by physicians engaged in private practice. These patients (Series II) received diagnostic tests at the hands of their own physicians with pollen materials obtained from the University. The results of the tests and a record of the period of symptoms were forwarded to us and served as the basis for compounding the treatment mixtures.

The results of treatment were rated as follows:

Complete or near complete relief..90% to 100%
Marked relief 75%
Fair relief 50%
Slight relief 25%
No relief 0

†R. V. Ellis and C. O. Rosendahl: The Specific Treatment of Hay Fever with Especial Reference to Minnesota. MINNESOTA MEDICINE, July, 1934.

The results in Series II were slightly better than for Series I, especially for the classification of slight and none. The combined results for Series I and II gave 40 per cent complete relief, 30.8 per cent marked relief, 16 per cent fair relief, 9.8 per cent slight relief, and complete failure in 3.4 per cent. (Table II.)

Since the treatment materials were all derived from the same source and the mixtures were all prescribed by myself, any errors concerning treatment materials furnished should have been fairly constant.

There was considerable variation in the period or duration of treatment, the interval between treatments, the total number of treatments given and the dosage.

Neither the number of injections given (Table III) nor the length of the period over which treatment extended (Table IV) correlate as well with results obtained as does dosage (Table V).

TABLE III. NUMBER OF TREATMENTS

Series	Maximum		Minimum		Average	
	I	II	I	II	I	II
Relief:						
Complete	30	34	12	16	21.6	26.
Marked	26	40	10	15	17.4	23.7
Fair	21	35	10	14	14.3	22.1
Slight	25	32	10	14	14.	22.
None	22	30	18	7	20.	18.

Comparison of Results with Previous Treatment

Increase in knowledge concerning the causes of hay fever and the increased accuracy of diagnosis should improve results of treatment. Very few patients in Series I had had previous treatment. However, of the eighty patients in Series II, forty-one had had treatment previously for a combined total of one hundred four years, or an average of 2.5 years each. 87.8 per cent of these patients reported better results than with any previous treatment, while 12.2 reported results about the same as before (Table VI). It seems reasonable to attribute this improvement in results to increased accuracy of the specific treatment.

TABLE IV. TREATMENT PERIOD IN WEEKS

Series	Maximum		Minimum		Average	
	I	II	I	II	I	II
Relief:						
Complete	30	28	13	7	20.4	15.9
Marked	29	27	10	5	19.	15.7
Fair	25	27	13	7	16.5	17.
Slight	26	28	9	11	16.3	16.
None	15	15	13	5	13.9	10.

TABLE V. DOSAGE IN MG. NITROGEN

Series	Maximum		Minimum		Average	
	I	II	I	II	I	II
Relief:						
Complete	.15	.25	.012	.02	.067	.125
Marked	.1	.25	.01	.01	.042	.094
Fair	.06	.2	.005	.01	.023	.068
Slight	.035	.075	.003	.01	.02	.04
None	.037	.2*	.012	.0005*	.028	

*One case.

Reports concerning the results of specific treatment are not numerous. It is interesting to compare the results obtained in this study with a few of the more noteworthy published results (Table VII). The results in both Series I and Series II are better than for any of the others. The results obtained by Piness in Los Angeles compare more favorably with Series II. He reported a lower percentage of excellent results than for Series I but he also had a lower percentage of poor results. These results are all the more interesting if account is taken of the amounts of pollen to which patients are exposed in the regions concerned. It will be seen that Piness is favored by a small pollen incidence, only a trace as compared with that of our own region.

TABLE VI. COMPARISON OF RESULTS WITH PREVIOUS TREATMENT
SERIES II

Relief	Previous Treatment				Results This Year		
	No	Yes	Case Yrs.	Av.	Improved	Equal	Not as Good
Complete	15	18	63	3.5	15	3	0
Marked	11	17	30	1.7	15	2	0
Fair	9	4	6	1.5	4	0	0
Slight	3	1	5	5	1	0	0
None	1	1	?		1	0	0
	39	41	104	2.5	36 (87.8%)	5 (12.2%)	0

TABLE VII. RESULTS WITH SPECIFIC TREATMENT OF HAY FEVER

		Percentage Results		
		Excellent	Satisfactory	Poor
Cooke and Vander Veer	(3)	12.	52.	36.
Vander Veer	(3)	23.	49.	28.
Walker	(3)	25.	52.	23.
Backemann	(2)	10.	66.	24.
Piness	(1)	29.6	61.5	9.1
Series I	(4)	38	41.2	20.8
Series II		41.2	51.2	7.6
Series I and II		39.1	46.7	13.2

Relative Amount of Pollen

(3) New York City:
(2) Boston, Massachusetts:
(1) Los Angeles, California:
(4) Minneapolis, Minnesota:

TABLE VIII. TREATMENT REACTIONS

Relief	Complete		Marked		Fair		Slight		None		Total	
Series	I	II	I	II	I	II	I	II	I	II	I	II
Hay Fever		11		5		1		1				18
Asthma	1	7		14				1			1	22
Urticaria	1	16		3	1	1		1			2	21

	Injections	Reactions	Per cent
Series I	1145	3	.2
Series II	1654	61	3.6

Treatment Reactions

Treatment reactions may range from mildly unpleasant to dangerous. Careful attention to and increased familiarity with technic of administration will render them infrequent. In my own Series I reactions occurred following three of 1,145 injections, or in 0.2 per cent. In Series II reactions were eighteen times more frequent than in Series I (See Table VIII). Many of these reactions can be attributed to a too short interval between treatments. An interval of five to seven days seems to be ideal.

Reactions are largely avoidable and fear because of them is no longer a justifiable reason for non-use of the method.

MULTIPLE SENSITIVITY IN HAY FEVER*

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THE goal to be sought in the treatment of hay fever is the complete absence of symptoms—nasal, ocular, or asthmatic. This goal can be achieved in some cases. It can be approached in almost all cases. An adequate conception of what hay fever is, followed by a proper study of its causes, and a thoroughgoing scheme of treatment will accomplish this result.

For years we have known that hay fever is one manifestation of an allergic constitution, that people who came to us complaining of hay fever, including fall hay fever, kept on coming to us with winter colds, perennial hay fever, asthma, eczema, or hives. We have known that

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these people have told us that their parents, their sisters, their cousins, or their aunts have had hay fever or asthma, or that their children have had eczema or hives. But for almost as many years we have seen, and our patients have seen, advertisements saying that "95 per cent of fall hay fever can be cured by treatment with ragweed pollen extract." And for almost as many years we have given fifteen doses of ragweed pollen extract out of fifteen little bottles. Sometimes our results have been good, but too often our fifteen little bottles have failed to satisfy either patient or doctor. Gradually we have been forced to investigate further.

As Dr. Rosendahl and Mr. Dahl have already shown, there is not one, but there are many plants in Minnesota whose pollen is such that it can cause hay fever. Dr. Ellis has demonstrated that persons suffering from hay fever are likely to be just as sensitive to others of these plants, as well as to ragweed.

I am sorry that I must further complicate this picture, or perhaps better say that I must further clarify the status of the patients who are less easily treated. During the past three years I have studied, more and more completely, one hundred people whose complaint was fall hay fever. This study included the family history, particularly in regard to allergic manifestations, personal history, general physical examination, and skin tests for the groups of pollens discussed by Dr. Rosendahl and Dr. Ellis, and also an increasing series of foods, animal danders and dusts. The results of this study, which includes a heterogeneous group of dispensary and private patients varying in age from eight to seventy-four years, agree, in regard to pollens, to a remarkable extent with those of Dr. Ellis. Among these hundred patients the history of others in the family with allergic symptoms was high. I have not charted these because the error in diagnosis must be such as to make percentages untrustworthy. I have, however, charted the other allergic diseases among patients themselves. Sixty-one of the one hundred patients had other allergic symptoms than just hay fever —asthma for the most part, then perennial hay fever often associated with nasal polyps, also urticaria, eczema and migraine.

The results of skin testing are important. Among the one hundred patients there were only four who were, perhaps, sensitive to ragweed alone. These came early in the series and their skin tests were very limited in number. Possibly some were sensitive to proteins we were not using at that time. There were ninety-two who were sensitive to ragweed, and also to other pollens, to foods, to epidermals, and to dusts. Of these, sixty-one were sensitive to proteins other than pollens; and these account for many of the unsatisfactory results. On the other hand there were four patients who were not sensitive to ragweed in any degree that I could discover. These also had fall symptoms. One was sensitive to the sage wormwood family of plants, to corn and to horse dander. Another was sensitive to the proteins of the grains and his symptoms came with the cutting and threshing of the grain on his farm. Failures among this small group are inevitable if they are treated with ragweed pollen only.

To return to those sensitive to ragweed and also to other proteins, this is the group in which partial relief is the rule, but complete relief is difficult to obtain. It would be easy to cite cases: the woman sensitive to feathers who goes through the chicken house at the County Fair, or sleeps on a feather pillow; the man sensitive to dog hair, who cannot bear to part with his best friend for even six weeks, and on and on. The figures are enough to show that the simple picture is the rarity. The failures are usually the patients with the more complex pattern.

Last year the ragweed pollen count was very high and patients not intensively treated had more intense and more prolonged symptoms than usual.

To summarize and conclude: Fall hay fever is one manifestation of an allergic constitution. Fall hay fever can be treated with results that compare well with any procedure in medicine, namely 85 to 90 per cent success. Failures are due to: (1) incomplete diagnosis; (2) incomplete treatment; and (3) insufficient treatment.

THE CLINICAL SIGNIFICANCE OF THE SEDIMENTATION RATE IN CORONARY OCCLUSION*

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IN recent years an enormous amount of literature has accumulated relative to the various phases of the subject of coronary thrombosis. One would expect therefore to find numerous references to the sedimentation rate of the red cells in this disease, particularly, as the pathological change in this condition is one that would suggest at once an increase in the sedimentation rate. However, the paucity of published detailed reports is striking.

Rabinovitz, Shookhoff, and Douglas,[3] in 1931, reported the sedimentation rate in ten cases of coronary occlusion. Their findings indicated that the sedimentation rate was definitely increased, that this increase appeared later than the leukocytosis and fever, and persisted longer. They felt that it was of value as an index of healing. In 1934 Burak[2] studied six cases, verified the findings of Rabinovitz, and also felt that it had some diagnostic value. The following year Bickel, Mazer, and Sciclonoff[1] found a high sedimentation rate and felt that it indicated a softening of the heart muscle, and was due to absorption of necrotic tissue. They felt it was not due to cyanosis or myocardial failure. In 1936 Wood reported seven cases. Two were seen seventeen and forty-nine days after the occlusion and showed normal figures; the remainder all showed accelerated rates. He emphasized the fact that the presence of myocardial failure retarded the sedimentation rate, and that this fact must be considered in interpreting the rate in coronary occlusion.

An increase in the sedimentation rate is found in infections, malignancy, hyperthyroidism, healing wounds, fractures, etc. The mechanism producing this change, although not entirely clear, apparently is associated with serum globulin and at times serum fibrinogen changes.

This report is based on observations made on sixteen cases of coronary thrombosis, in which the diagnosis could not be questioned. All other conditions known to produce an increase in the sedimentation of red cells were ruled out and not included in this series.

The technic used was that of Westergren, and only the one hour reading is reported. In many cases, it was not possible to continue the determinations until the rate had returned to normal.

Values in millimeters at the end of one hour according to Westergren and Burak are:

WESTERGREN			BURAK
mms. (male)	mms. (female)		mms.
1	4	Subnormal	
3	4-7	Normal	
4-7	8-11	Borderline	
8-11	12-15	Weakly positive	8-15
12-35		Moderately positive	16-30
35-80		Strongly positive	31-60
80		Very strongly positive	80-100

A brief summary of the history of each case is given which perhaps adds a little to the significance of the figures found. The diagnosis of coronary thrombosis was made either by the alteration in the electrocardiograms, while the patient was under observation, or by the autopsy examination.

In our determinations we have taken any reading above fifteen as being suggestive, although the reaction usually was so marked that there was no question as to its significance. In this series no attempt was made to group the cases according to the severity of the attack or on the basis of the degree of change in the sedimentation reaction. Although there does seem to be some relationship between the degree of injury as judged by the clinical history and course of the illness with sedimentation rate, this is not at all constant.

Case 1.—A steel worker, thirty-eight years of age, for the first time, four weeks before, had suddenly experienced a sharp pain that began on the lateral aspect of the right arm and radiated across the chest to the left arm. This was accompanied by a sense of constriction and he had to stop walking until the sharp pain ceased after about three minutes. For four weeks he had had some pain almost every day.

*Read before the Minnesota Society of Internal Medicine, November 11, 1935.

CHART I

Case 1 Day	S.R.	W.B.C.	T.	P.	B.P.	Pain	E.K.G.
1		20,000	99.6	90	150/80	Sev.	Flat T-1
2	8	11,200	101.6	110		Sev.	Invert. T-1
4	73	15,000	100.0	100	120/70	Mod.	
6	76	12,700	99.6	78		Mod.	
9	68	9,800	98.8	88	115/75	None	
12	55	8,000	98.0	80	120/80	None	
17	8		98.0	80		None	
19	6	8,900	98.0	80	115/70	None	
23	2		98.0	80		None	

CHART II

Case 2 Day	S.R.	W.B.C.	T.	P.	B.P.	Pain	E.K.G.
1	6	16,200	98.8	80	120/80	Mod.	Norm.
2		14,900	99.2	78			
4	42	9,400	98.6	72		Mod.	T flat
8	39	7,400	98.2	68	106/76	None	
12	13	7,400	97.4	70	106/76	None	T invert

CHART III

Case 3 Day	S.R.	W.B.C.	T.	P.	B.P.	Pain	E.K.G.
1	21	7,200	Nor.	78	144/102		L. Vent. Prep.
2	24	7,400	Nor.	78	166/110		T-1 flat
4		9,900	Nor.	84			
5	11	10,000	Nor.	82			
9	13	10,000	Nor.	80	160/110		
11	15	8,000	Nor.	70	148/94		
16	12	12,000	Nor.	86	136/94		
24	25	12,000	Nor.	76	164/190		Normal
34	28	17,500	Nor.	74	180/110		
44	27	7,600	Nor.	74	186/110		
69	23	11,500	Nor.		190/110		

Slight exercise and overeating would cause trouble. The night before he entered the hospital, he had a pain that lasted twenty-five minutes. The morning of his entrance to the hospital, he had another severe pain that did not respond to the measures that formerly gave relief.

The examination showed a marked puffiness of both lids, more marked on the right side. The heart showed nothing of note.

Comment.—In this case the sedimentation rate came back to normal between the twelfth and the seventeenth day. He was allowed to get out of bed, and on gradually increasing exercise he had no recurrence of his trouble. Because of previous experience, it was thought that an interval of five days between test determinations would be sufficient at such an early stage of the disease, and the sudden return of the sedimentation to normal was then quite surprising. Several of the later cases also showed a rather quick return to normal.

Case 2.—Two days before his admission, a grocer, forty-one years of age, had a sharp precordial pain that lasted only a few seconds. On the morning of his admission to the hospital, he had a constant substernal pain, which was still present when he entered the hospital four hours later. The physical examination showed a short presystolic murmur in the mitral region, and the x-ray examination of the heart showed a mitral contour.

Comment.—This patient made an uneventful recovery, but at times he had some indefinite pains that might have been coronary.

Case 3.—A professional man, aged thirty-seven, has been under observation for a number of years, and at no time has he had any indications of heart disease. On one occasion, several years ago, he had a severe pain in his right leg, which was diagnosed, in another city, as Buerger's disease. Examination three weeks later failed to disclose any trouble. For the last two years he has been having a rise in blood pressure that appeared to be advancing quite rapidly.

The night before entrance to the hospital, he experienced an intense pain, starting between the shoul-

CHART IV

Case 4 Day	S.R.	W.B.C.	T.	P.	B.P.	Pain	E.K.G.
1	37	26,000	98.0	120	220/90	Severe	Def. changes
2	89	24,000	99.6	122	128/90	Severe	
5		10,000	99.4	110	140/90	Severe	
10	81	9,500	98.8	100	138/90	None	T-1 flat
15	88	9,900	98.6	94	120/90	None	
19	84	7,600	98.6	80	120/88	None	
24	81	8,400	98.6	86	129/69	None	
27	73	7,800	98.6	82	118/72	None	
34	76	11,000	98.6	80	130/80	None	
41	66	10,000	98.6	80	140/80	Slight	
62	36	11,000	98.6	78	140/80	None	

CHART V

Case 5 Day	S.R.	W.B.C.	T.	P.	B.P.	Pain	E.K.G.
4	90	11,000	100.4	96	110/80	Severe	T-1 invert
6	88	9,600	101.0	96	80/80		
7	90	8,400	99.2	94			
8	90	7,600	98.6	100	110/80	Moderate	T-1 arch.
9	82	8,400	98.6	94			
10	98	8,600	99.4				
11	98	8,800	98.6	92			
12	90	7,200	98.4	82			
14	90	6,400	99.0	80	120/76		
16	90	6,400	98.0	76			
18	90	8,800	98.0	80	118/80		
20	96	6,200	98.0	82			
23	80	7,700	98.6	82	114/80		

der blades and extending around over the left precordial region. This pain lasted about twenty minutes. Examination showed a moderate obesity, a tympanitic second aortic sound, and a blood pressure of 180/100.

Comment.—This case is interesting as this patient had only one pain. The sedimentation rate was normal from the fifth to the sixteenth day, and then rose to its previous level. During this period there was a slight increase in the leukocyte count. The moderate increase in the sedimentation rate was present for over two months, and during this period the patient complained of some distress in the left upper abdomen and left chest which presumably was connected with an active process in the heart muscle. Both the clinical and the laboratory courses of this case were quite unusual, and suggest the possibility that in some cases a patient does not recover very quickly from even slight myocardial injuries, and that there might be going on, at the same time, both healing and extension of the process. If such a condition does occur, this method of study should prove to be excellent as a means of following the course of the process.

Case No. 4.—A housewife, fifty years of age, gave a history of having been under a physician's care for heart trouble seven years ago. At that time, she complained of dizziness and shortness of breath. Five years ago she had a cholecystectomy, but no heart disease was noted then.

Two weeks before entrance to the hospital, she had had a severe precordial pain and shortness of breath, and twenty-four hours before she had had a sudden severe pain in the right shoulder extending down the right arm. She said it felt as if her arm was broken. Later the pain extended over the precordium. One-half grain of morphine did not stop the pain, but it gave some relief. The blood pressure was 220/120. Cyanosis of the lips and finger tips was present, and the face had an ashen hue.

Comment.—At the end of the sixty-second day, the sedimentation rate was still high, although it had dropped to one-half of its former value. The leukocyte count, at the fifth day, was almost normal. After the fifteenth day, there was no longer any pain.

Case 5.—Male, aged fifty, a merchant.

For two years, off and on, this patient had complained of precordial pain following exertion and heavy eating. Three days before entrance to the hospital, while in a hotel in Chicago, he had a very severe pain over the entire upper chest, which was relieved by morphine.

Comment.—At the end of the twenty-third

CHART VI

Case 6 Day	S.R.	W.B.C.	T.	P.	B.P.	Pain	E.K.G.
1	32	9,500	98		240/120	Moderate	T-1 changed
2	35	11,000	99.2		180/80	None	T-1 flat.
3	61	8,400	98		190/90		
4	75	8,000	97		190/90		
5	70	7,200	Nor.		190/100		
6	71	8,400	Nor.		190/100		
7	74	8,000	Nor.				
8	59	8,000	Nor.		190/100		
9	57	6,200	Nor.				
10	34	8,000	Nor.				
12	66	6,000	Nor.		170/100		
13	50	6,000	Nor.		160/80		
14	61	10,000	Nor.				T invert
19	59	6,000	Nor.		190/90		
20	53		Nor.				
43	40	5,700	Nor.		240/100		

CHART VII

Case 7 Day	S.R.	W.B.C.	T.	P.	B.P.	Pain	E.K.G.
2		14,000	97.6	72	190/120	Dull	Inver. T-I & T-II
3	42	13,200	100.2	84			Inver. T-I & T-II
4	47	10,400	99.6	80			
5	64	9,200	99.2	80			
6	87	5,600	98.6	70			
7	79	6,800	98.4	70			
8	80	8,000	98.6	74			
9	77	7,500	99.8	70			
10	80	7,600	98.4	70			
13	85	7,200	98.2	72			
14	65	7,200	98.4	70			
17	53		98.4	70			T inver.
19	60		99.0	68			
21	32		99.0	70			
24	51	5,600	99.0	62			
25	51	7,600	98.6	64			
26	50	6,800	99.0	72			
27	41	6,600		74			
33	39	8,800					

day the sedimentation rate was still very high, although the leukocyte count was normal on the seventh day. The patient was sent home to bed, and on the thirty-seventh day he had another attack, which was much more severe than the previous one. One and one-half years later, he still has precordial pains on exertion or excitement.

Case 6.—A manufacturer, seventy-four years of age, gave a history of having had precordial pains for a number of years. The present attaok apparently began early on the morning of the day of admission. There was severe precordial pain radiating to the left arm, with nausea. The examination, except for a marked hypertension and an enlargement of the heart to the left, was negative.

Case 7.—A woman, agèd seventy-three, the day before admission to the hospital, began to complain of a dull ache over the precordial region, extending into the left arm. Her past history was negative. The examination showed a heart enlarged to the left, and a blowing systolic murmur over the precordium. On admission the blood pressure was 190/120. The following day the pain disappeared.

Comment.—The sedimentation rate in this case did not run as uniform a course as did most of the others. Ninety-seven days after the onset, the patient died at home of pulmonary embolism. The autopsy examination showed several scars in the myocardium with marked sclerosis of the coronary arteries.

Case 8.—The patient, a woman aged sixty-six, had precordial pains off and on for three years. The last attack, which was very severe, began on the morning of her entrance to the hospital. The pain was located in the precordium and radiated to both shoulders. It was not relieved by nitroglycerin.

CHART VIII

Case 8 Day	S.R.	W.B.C.	T.	P.	B.P.	Pain	E.K.G.
1	67	7,000	100.0	80	150/90	Severe	Nothing definite
3		6,500				Moderate	
5		9,800	99.2		164/88	Moderate	
8		10,850	98.6	88		Moderate	
11		7,400			160/80	Moderate	
15		7,100	98.8	96	176/94	Moderate	
24	68	7,000	99.0	80		Moderate	

CHART IX

Case 9 Day	S.R.	W.B.C.	T.	P.	B.P.	Pain	E.K.G.
5	84	8,600	98.0	70	164/80	Moderate	Flat T-1
7	70	4,300	98.0	120		Severe	
9	74	11,200	99.6	120	175/110	Moderate	T-1 flat
10	73	12,000	101.0	140	135/86	Severe	

CHART X

Case 10 Day	S.R.	W.B.C.	T.	P.	B.P.	Pain	E.K.G.
1	44	8,300	98.0		220/86	Moderate	Invert T
12	53	6,000	98.0		190/110		
17	26	6,900	98.2		210/110		
25	103	8,800	100.4		130/70		
27	108	10,000	98.2		120/70		
30	111		98.0				
37	109	10,300	98.2		125/80		
78	55		98.6				
84	112		97.0		137/70		Invert T-1
137	71	9,200	97.2				
145		10,200	98.2		140/86		
147		8,500	97.0				
187	78	10,150	97.0				
204	60	8,400					

Comment.—This was the only case in the group in which there was not definite electrocardiographic evidence of coronary infarction. The leukocyte count was slightly elevated on the eighth day, but the sedimentation rate was very high on the last day. This patient continued to have pain for six weeks after leaving the hospital, when she moved to California.

Case 9.—A retired merchant, aged fifty-six, for eight years had had attacks of burning precordial pain on exertion. These pains would cause him to stop work until it disappeared. Five days before entrance to the hospital, he had had three attacks of pain that were not relieved by rest or medication. The following day, he drove 500 miles by auto to return to his home. Since that time, the pain, although not severe, was more or less continuous.

Coronary thrombosis was suspected, and against his will he was put to bed. Physical examination was essentially negative, although the heart tones at the apex seemed unusually soft. The blood pressure was 140/80, and whereas formerly it was 160/100.

Comment.—On entrance into the hospital the leukocyte count and temperature were normal. The sedimentation rate was 84 mm. The electrocardiogram showed evidence of coronary disease but was not characteristic of coronary thrombosis. It was felt, however, because of the high sedimentation rate, that he had a coronary occlusion that had occurred five days previously, but in the interim the temperature and leukocyte count had returned to normal. Two days after admission into the hospital, a loud precordial rub was heard, and the patient died five days after his entrance.

Case 10.—This patient, a woman aged eighty-one, for years had been under medical care for coronary sclerosis and hypertension. She was admitted this time for pain over the precordium that radiated into the left arm. The heart was enlarged to the left; the blood pressure was 220/86. The second aortic and second pulmonic heart tones were accentuated.

Comment.—This patient entered the hospital

CHART XI

Case 11 Day	S.R.	W.B.C.	T.	P.	B.P.	Pain	E.K.G.
1	5	9,200	100.2	100	126/90	Severe	
2	15	15,900	98.0	80	120/90	None	
4	18	12,000	98.0	80	128/90	None	T-1 inver.
6	7	13,400	98.0	80	130/90	None	T-2 flat
9	7	10,000	97.0	60	122/80	None	
13	2.5	8,600	97.0	64	120/80	None	

without any increase in temperature or leukocyte count. The sedimentation rate was only mildly elevated at the onset; later it reached the highest of any in the group. The x-ray at the onset showed some pulmonary congestion. On the 187th day there appeared to be a great deal of pulmonary congestion and a question of pulmonary infarction arose. It is difficult to say just how much this had to do with raising the sedimentation rate. This patient eight months later died, and the autopsy showed pipestem coronary arteries, but no definite evidence of coronary occlusion.

Case 11.—The patient, a man aged thirty-nine, never had had cardiac trouble, except that two days before the attack he had had a slight precordial pain that lasted only a moment. The attack itself was very severe and consisted of upper abdominal and precordial pain with nausea. Physical examination was negative except for the ashen color of the face, the listlessness, and dyspnea. Five hours after the onset, a definite precordial friction rub was heard, which disappeared by the next morning. Within one hour after the attack the first sedimentation rate was made, and it was normal.

Comment.—This case shows several interesting points. The sedimentation rate rose after the leukocyte count, as in the other cases, but returned to normal in four days, several days before the leukocyte count came down. It is difficult to believe that a coronary infarct could heal in such a short period and some doubt is cast on the value of the sedimentation rate as an indicator of healing. Here, as in one other case, the rate too returned to a subnormal value. The significance of this reading is not clear.

Case 12.—A woman, aged sixty-four, had a very severe precordial pain two days before entrance into the hospital. On admission the temperature was 101.4, pulse 98, blood pressure 154/96, leukocytes 13,600, sedimentation rate 93 mm. The electrocardiograph showed an inverted T-I. This patient died eight days after entering the hospital. No autopsy was secured.

Case 13.—A physician, aged fifty-nine, for six months previous to his present attack, had noticed progressive shortness of breath. Occasionally he had a mild anginal pain. The present attack began with a sudden severe pain in the midsternal region, radiating to the right arm. With this was shortness of breath and the feeling of compression in the chest. The pain lasted four hours. The blood pressure, which was formerly 160/100, dropped to 100/60. Twelve hours after the onset there was a pericardial friction rub present. Temperature on entrance to hospital was 100.8. On the day of the attack the leukocyte count was 6,200. The second day the count was 10,000 and the sedimentation rate in one hour was 45 mm. On the fourth day it was 40 mm. The electrocardiograph showed delayed conduction. The patient recovered from the attack and died of carcinoma of the stomach one year later.

Case 14.—A woman, aged fifty-five, had had hypertension for eight years. For one year she had anginal pains of a mild character. The present attack began with a severe pain over the precordium, which lasted half an hour. The blood pressure which was formerly 180/100 was now 100/40. Extra systoles were present, heart tones poor, râles were present at the bases of both lungs. The electrocardiograph showed myocardial damage and left axis deviation. Two days after the attack the temperature was 101, leukocyte count 16,000, sedimentation rate 90 mm. The patient died five weeks later of pulmonary embolism. No autopsy was secured.

Case 15.—A laborer, aged seventy-eight, felt perfectly well until twenty-four hours before admission to the hospital, when he experienced a severe anginal attack. Two days later the leukocyte count was 13,400, the sedimentation rate was 98 mm. On the third day the sedimentation rate was 80 mm. He died on the fifth day. The autopsy showed a large coronary infarct.

Case 16.—A woman, aged sixty-four, had had hypertension for eight years. Thirty-six hours before her entrance to the hospital, she developed a severe precordial pain with nausea and vomiting. Previously, she never had had anginal pains, although for a year she had dyspnea. On entrance the leukocyte count was 16,000, and the sedimentation rate was 93 mm. The electrocardiograph showed an inverted T in the first lead and an arching ST. The temperature on admission was 101.2. She died at the end of the eighth day. No autopsy was performed.

Discussion

Sixteen cases of coronary occlusion were studied. Every case showed an increase in the sedimentation rate of such magnitude that its signifi-

icance cannot be questioned. Only four cases failed to show a rate of over 50 mm. in one hour, and these four showed a reading of 18, 28, 42 and 45 mm. The remaining cases at some time during the illness showed a rate of 70 mm. or more, all very strong reactions.

CHART XII

Sex	Age	Sed. Rate	Outcome
M.	38	18	Recovered
M.	37	28	Recovered
M.	41	42	Recovered
M.	59	45	Recovered
F.	66	68	Recovered
M.	74	75	Recovered
M.	38	76	Recovered
M.	56	84	Died
F.	73	87	Recovered
F.	50	89	Recovered
F.	55	90	Died
F.	64	93	Died
F.	64	93	Died
M.	50	96	Recovered
M.	78	98	Died
F.	81	112	Died

Although Rabinovitz and his co-workers found that the increased rate occurred at periods ranging from two to five days after the attack, we had several cases that showed a definite but not maximum increase in the first twenty-four hours. In the other cases seen on the first day the rate was normal. It appears to be quite definite, however, that in the majority of the cases the leukocyte count and the temperature rise before the sedimentation rate. Therefore in the first few days following the occlusion its diagnostic importance does not rank with the temperature and the leukocyte count. Its real value lies in the fact that it usually persists for a much longer period than either of the above mentioned factors, which are often quite brief in duration and occasionally even absent. In Case 9 the occlusion evidently occurred five days before the patient came under observation. The history was not typical of coronary thrombosis. The leukocyte count and temperature were normal. The sedimentation rate was 84 mm. The development of a pericarditis two days later proved the presence of the thrombosis. In this case a coronary thrombosis was suspected but the only evidence that we had that an acute injury to the heart muscle had occurred was in the sedimentation rate. In Case 8 there was only a slight elevation of temperature for two days, yet the clinical history and the course was typical of an acute coronary occlusion. The electrocardiograph and leukocyte count were normal, but the sedimentation rate reached 88 mm.

The sedimentation rate in all cases but one outlasted the leukocytosis and the rise in temperature. In Case 2 it had returned to normal in thirteen days; in Case 11 on the fourth day; in Case 3 it was still high on the sixty-ninth day; and in Case 4 on the sixty-second day.

There is apparently no definite relationship between the severity of the attack as judged by clinical standards and the sedimentation rate. Neither can we predict the length of time that the sedimentation rate will remain increased. Case 1 had apparently a very severe attack of pain, prostration, cyanosis, a marked elevation in the temperature and the leukocyte count, yet, within twelve to seventeen days the rate had returned to normal, whereas, Case 2 had what seemed to be a very mild attack, but also had a very short period in which the sedimentation rate was elevated. Case 3 had only a mild attack with no rise in temperature and one of the lowest sedimentation rates in the entire group, yet it persisted over two months.

Although there is some variation in the sedimentation rates in individual patients from time to time, it is rarely great enough to be significant. Marked reduction in the reading on two successive days may indicate healing, or, if the rate is increased, a complication, such as an extension of the infarction, a pericarditis, or a new infarct.

From what we know of the conditions which are accompanied by an increased sedimentation rate, and of the nature of the pathological change in coronary occlusion, we can assume that as long as a sedimentation rate is elevated there is an absorption of the products of heart muscle degeneration, and that healing is completed when the rate has returned to normal. If this is true some cases have a healing of their injury in a period less than two weeks, whereas, in others, and perhaps the majority of the cases, the process may take longer than the six weeks period assumed at present as being the period necessary for healing to take place. Case 2 throws some doubt on the possibility that healing is complete when the rate has returned to normal. The observations of Wood that the sedimentation rate decreases with the onset of myocardial failure must be kept in mind.

The technic of the test is simple. The ap-

paratus is not elaborate and the performance of the test does not require the services of a highly trained technician. In this particular disease the deviation from normal is usually so marked that the reading presents no difficulty. From our own experience and that of others it seems that this test should prove itself to be of value in the treatment of cases of coronary occlusion and to a lesser extent in the diagnosis of this disease.

Summary and Conclusions

1. The sedimentation rate in sixteen cases of coronary thrombosis is reported.
2. Elevation of the rate was found in every case.
3. The degree of increase in the sedimentation rate is no index of the severity of the injury.
4. The return of the rate to normal usually means a healing of the infarction but this is by no means invariably true.
5. The determination of the rate is of diagnostic and prognostic value when considered with other findings.

I wish to thank Dr. Edgar Herrmann and Dr. John Briggs for permission to include several of their cases, and Dr. Kano Ikeda for his laboratory assistance.

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NAUSEA AND VOMITING OF PREGNANCY*

Fifty Cases Treated With Estrogenic Preparations

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THE woman suffering from nausea and vomiting of pregnancy presents a much more serious problem than is generally realized. The attending physician too frequently makes light of the symptoms with the thought that vomiting is a normal manifestation of pregnancy. The patient continues to suffer the distressing and often serious symptoms. One is probably too prone to feel that the nausea and vomiting will cease in due time and that little in the way of therapy will effect a cure. One searches diligently for the cause of a minor dyspepsia, and, with considerable care, plans the dietary and medicinal measures for its relief, while the woman suffering from nausea and vomiting of pregnancy receives little attention unless toxic symptoms appear.

It is estimated that one-third of pregnant women have nausea and vomiting as a marked symptom, one-third complain of this symptom in a mild degree, and the other third are entirely free from it. A certain percentage of pregnant women develop pernicious vomiting; some of them will abort and a few of them will die.

The vomiting, with accompanying nausea, usually begins the fourth to the sixth week, but in many instances it may appear earlier and has been known to appear even before the first menstruation is missed. It usually lasts from six weeks to three months, most frequently ceasing during the fourth month. Primiparæ vomit earlier, more constantly and more severely than multiparæ. Vomiting may occur in succeeding pregnancies but usually in less severe form. As a rule, it ceases when the fetus dies. Certain animals, particularly dogs and cats, may suffer from nausea and vomiting of pregnancy.[10]

It is difficult, in a given case, to determine when the vomiting passes from the usual type to the severe form. Peckham,[30] in reviewing sixty cases of hyperemesis gravidarum occurring at Johns Hopkins Hospital, found that the time of onset, duration of vomiting, and loss of weight do not indicate the severity of the disease. Neither do they afford a safe guide for prognosis. He concluded that the urinary albumin is frequent but of slight prognostic importance and that a high ammonia coefficient is

*From the Brainerd Clinic. Read before a joint meeting of the Upper Mississippi and St. Louis County Medical Societies, Aitkin, Minnesota, April 25, 1936.

usually seen, yet a low one does not necessarily indicate a mild case. Therefore, there is little to aid one in determining when a mild case may become alarmingly severe. It is probable that the condition originates as "morning sickness" and gradually becomes more severe due to dehydration and starvation.

There is no field of obstetrics concerning which more divergent opinions are held, both as to etiology and therapy. Duncan and Harding[12] were convinced that in early toxemia of pregnancy the dominant factor is a metabolic one, due largely to a carbohydrate deficiency. Titus, Hoffman and Givens[40] stated that the carbohydrate deficiency is of twofold origin: a relative deficiency due to an unexpected demand for glycogen on the part of the fetus and enlarging uterus, and an actual deficiency from lessened carbohydrate intake. Other investigators have concurred with the glycogen deficiency theory.[5,8,9,15,29,39] Haden and Guffey[14] found a low blood chloride content and recommended the administration of sodium chloride. Hirst[17] has advanced the view that vomiting of pregnancy is dependent upon deficient corpus luteum secretion. The theory that starvation brings about an acidosis or an alkalosis was advanced by Marchbanks.[25] La Vake[24] states that the nausea and vomiting are of toxic origin, the toxin being derived from the protein constituting the male element in the fertilized ovum and that this toxin acts on the vomiting center and vital organs. That the primary etiologic factor is psychotic or neurotic is maintained by Atlee,[4] Allen,[1] and others. That some cases are of neurotic origin and others toxemic has been held by numerous writers.[10,19,33,41,42] Arzt[3] concluded that the low acid content of the stomach in early pregnancy may have some influence. Alvarez[2] describes reverse peristalsis resulting from pelvic disorders. Kemp[22] believes the condition due to a cortico-adrenal deficiency. Disturbances of calcium metabolism,[11] foci of infection,[38] changes in the kidneys and ureters,[21] toxic excretion from the zygote,[13] and pelvic infections and displacements have been mentioned as etiologic factors in nausea and vomiting of pregnancy. Gallbladder disease, peptic ulcer, appendicitis, et cetera, are included as infrequent causative factors.

The types of therapy have been nearly as divergent as the theories of etiology. An analysis of the literature over the past twenty years shows that the most frequent type of therapy consists of: glucose administered intravenously, with or without insulin; intravenous saline; bromides per rectum; alkalies; and corpus luteum extract. The mild type of case was most frequently treated with a high carbohydrate diet, oral sedatives and alkalies. Thirty-eight writers used glucose intravenously, saline was recommended by eight, a combination of glucose and saline by five, insulin was administered by fourteen, bromides per rectum by ten, oral or hypodermic sedatives by twenty-five, and a high carbohydrate diet was used by seventeen. Hydrochloric acid, orally, was recommended by six authors, corpus luteum extract was advocated by fifteen and ovarian extract was used by five. One investigator suggested placental blood serum.[27] Several writers stressed the elimination of foci of infection and correction of cervicitis, cervical erosions, et cetera. The advocates of the neurotic theory isolated their patients and directed therapy toward the elimination of neurotic factors. The administration of suprarenal extract has been used with great success by Kemp.[22] Stemmer[36] also recommends adrenal cortex extract as an adjunct. Various other methods such as cervical tampons of mercurochrome,[32] electrotherapy,[20] ultra-violet irradiations,[18] low protein diet,[5] and blood serum of pregnant women[17] have been recommended. The majority use a combination of several types of therapy and vary the treatment depending upon the cause. The results of all types of therapy would seem to show that 85 to 90 per cent of patients are relieved.

TABLE I. TYPES OF THERAPY RECOMMENDED
(80 WRITERS)

Glucose solution intravenously	38
Oral or hypodermic sedatives	25
High carbohydrate diet	17
Corpus luteum extract	15
Alkalies	15
Insulin	14
Bromides per rectum	10
Saline solution intravenously	8
Hydrochloric acid orally	6
Ovarian extract	5
Gluco-saline solution intravenously	5
Adrenal cortex extract	3

The series here reported consists of fifty cases of nausea and vomiting of pregnancy treated with estrogenic preparations. All classes of patients are included, though the majority were rural women. Sixteen patients, classed as mild

cases, complained of "morning sickness" and vomited a portion of their food; nineteen patients, moderately severe cases, vomited all their food and retained small amounts of fluid; fifteen patients, classed as severe, retained nothing by mouth, and showed weight loss and other features characterizing severe vomiting of pregnancy. Three of the fifteen patients classified as severe received intravenous glucose along with estrogenic therapy. The rest of the patients in this series received estrogenic therapy alone. No suggestive therapy was used and no special instructions as to diet or behavior were given to any patient.

The estrogenic preparations used in treating these patients were: ketohydroxy-estrin (amniotin, progynon, theelin), the benzoic acid ester of dihydro-estrin (progynon B), dihydro-estrin (progynon D tablets),* and a hydrostable compound from placenta containing trihydroxy-estrin (emmenin). The dosage of the hypodermic preparations varied from 25 to 250 rat units. The oral preparations were given when the patient was able to retain them, or following the hypodermic preparations as a safeguard against further vomiting. The preparations used at the present time, which seem to give the best results, are the higher concentrations of the hormone in oil. These are given intramuscularly in doses of 250 to 500 rat units, every second to fourth day until vomiting has ceased. The slower absorption and higher concentrations offer the advantage of larger dosage and less frequent administration.

TABLE II. NUMBER OF INJECTIONS REQUIRED

3 patients	1 injection
4 patients	2 injections
10 patients	3 injections
12 patients	4 injections
5 patients	5 injections
6 patients	6 to 7 injections
3 patients	8 to 9 injections
5 patients	oral or rectal

In this series forty-eight patients were completely relieved of all vomiting and two failed to react favorably to treatment. Eleven patients vomited again, from one to three weeks after therapy had been discontinued. All of these were retreated and the vomiting was completely controlled with estrogenic therapy alone. Nausea continued in ten cases after the vomiting had ceased. Three patients stopped vomiting after the first injection, four following the second, ten following the third, and twelve following the fourth. Fourteen patients required from five to nine injections. Patients re-treated for subsequent vomiting usually required two to four injections. In the more recent cases, the patients treated with estrogenic substances in oil have averaged about four injections before vomiting ceased entirely.

TABLE III. MISCELLANEOUS DATA

Primiparæ	21	cases
Multiparæ	29	cases
Average age of patients	32.8	years
Youngest patient	17	years
Oldest patient	42	years
Period Gestation Vomiting Began—		
Average	9½	weeks
Earliest	4	weeks
Latest	20	weeks
Duration Vomiting Before Therapy—		
Average	3½	weeks
Shortest	2	weeks
Longest	12	weeks

The youngest patient in the series was seventeen years, the oldest forty-two. The average age was 32.8 years. There were twenty-one primiparæ and twenty-nine multiparæ. The average period of gestation at the time vomiting began was nine and one-half weeks, the earliest four weeks, and the latest twenty weeks. The average time they had vomited previous to treatment was three and one-half weeks; the shortest period two weeks, the longest twelve weeks.

One of the most striking cases in the series was a single woman, twenty-two years of age, who had vomited for thirty days following cholecystectomy. Intravenous glucose and saline, proctoclysis, nasal suction, sedatives of all types and practically every type of therapy recommended for the relief of vomiting had been used. Fifty rat units of an estrogenic preparation were given intramuscularly, daily for three days. The patient ceased vomiting and on examination it was discovered that she was about two and one-half months pregnant.

No claim is made for originating the use of estrogenic preparations in nausea and vomiting of pregnancy. Stein and Leventhal,[35] in 1928, reported good results in four out of five patients suffering from severe hyperemesis gravidarum. They also noted that amenorrheic patients

*Not available commercially. Supplied through the courtesy of Dr. Gregory Stragnell, Schering Corporation, Bloomfield, N. J.

treated for sterility with estrogenic substances did not vomit when they became pregnant. Stragnell,[37] in 1932, reported a series of fifteen cases with but two failures. In 1935, it was pointed out by the author that this type of therapy was frequently successful.[16]

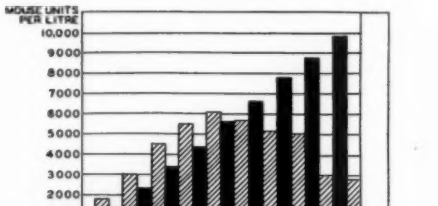

Chart 1. Comparison of estrin and prolan excretion in the urine during pregnancy. (Modified from Clinical Endocrinology of the Female, Mazer-Goldstein. W. B. Saunders Company, Philadelphia.)

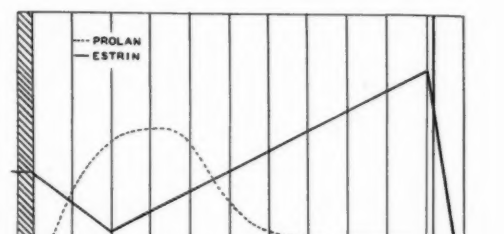

Chart 2. Variations in blood estrin and blood prolan during pregnancy.

The rationale of using estrogenic preparations in nausea and vomiting of pregnancy has not been definitely established. However, the association of estrin deficiency and the nausea and vomiting of pregnancy has been noted by Smith and Smith.[34] They found that the vomiting was associated with low estrin levels. Five patients, in their series, exhibited nausea and vomiting during the first trimester. A marked rise in estrin levels from low to high was synchronous with an amelioration of symptoms. The blood estrin content normally drops the first month or two of pregnancy. During the first two months the blood does not usually give a positive test for estrin. The estrin content of the blood then gradually rises until parturition.[26] The estrin excretion in the urine increases from a minimum of 600 mouse units per liter in the first month of pregnancy, to a maximum of 10,000 mouse units per liter at parturition[43] (Chart I). These findings, together with the clinical results obtained, would tend to show that a deficiency of estrin may be responsible for the nausea and vomiting of early pregnancy. It is possible that the high prolan level associated with the low estrin content may also be a factor. In normal pregnancy, a peak in the level of prolan occurs during the second, third, or fourth month, followed by a marked drop.[34] This drop in prolan and the marked rise in estrin coincides with the time that the vomiting usually ceases (Chart 2).

The dosage recommended cannot be considered harmful and the possibility of producing abortion is remote. Robinson and his co-workers[31] were unsuccessful in their attempts to produce therapeutic abortion in twelve women with large doses (50,000 to 6,800,000 international units) of estrogenic preparations from the seventh to the fourteenth week of pregnancy. They also reported that they had never noticed any ill effects either to the mother or child following the administration of this hormone.

The relatively high number of units excreted in the urine during pregnancy would make it appear that the dosage of estrogenic preparations used in the series was insignificant. However, the number of units excreted in the urine is far in excess of the number of units found in the blood serum and there is strong evidence to show that the two are not identical. The number of units required to produce a clinical effect in other conditions where estrogenic therapy has proven of value, is considerably less than the dosage calculated by experimental observations. It is possible, also, that we are dealing with a similar phenomenon as is found in amenorrhea with uterine hypoplasia. Kurzrok and Ratner[23] pointed out that the estrin excretion in many cases of genital hypoplasia is quantitatively the same as in normal women. It is necessary to build up the uteri to within normal limits by means of estrogenic preparations before they begin to respond again to the estrin supply of their own ovaries.

The various types of therapy recommended for the relief of this type of vomiting have a place

in selected cases. Foci of infection, uterine displacements, et cetera, may be an occasional cause for the vomiting and should be corrected. Estrogenic therapy cannot be expected to control vomiting due to these causes nor vomiting due to gallbladder disease or peptic ulcer.

Glucose solutions given intravenously are advisable, in conjunction with estrogenic therapy, in patients showing acidosis. However, the glycogen depletion of the hepatic cells is not the primary cause of vomiting, but is due to dehydration and starvation. The same pathologic changes found in the liver of patients dying with hyperemesis gravidarum can be duplicated experimentally by starvation and are seen to a lesser degree in certain wasting diseases.[28]

The neurotic theory is probably applicable to a small percentage of cases. The vast majority of patients do not vomit because they want to, or for no reason at all. The fact that patients have been known to vomit even before the first period is missed would tend to show that the neurotic theory has been over-emphasized. Several of the patients in the series were given placebos in the place of estrogenic preparations. The administration of these inert materials did not produce a cessation of vomiting. Vomiting began again, in several patients, when inert materials were substituted for standardized products.

Kemp's[22] results with adrenal cortex extract are difficult to explain through our present knowledge. The functions of the adrenal cortex are still much of a mystery. Britton and his co-workers[6,7] maintain that the adrenals regulate carbohydrate metabolism and contain a sex stimulating or estrogenic hormone. Proof of these contentions may explain the beneficial effects of adrenal cortex extract in nausea and vomiting of pregnancy.

The series herein reported is not large, nor is it convincing. Further trial may not duplicate the uniform results obtained and time may disprove the contention that estrogenic preparations will control the majority of cases of nausea and vomiting of pregnancy.

Summary and Conclusions

1. The woman suffering from nausea and vomiting of pregnancy presents a much more serious problem than is generally realized.

2. The distressing symptoms of nausea and mild vomiting are frequently neglected. It is difficult to determine when a mild case may become alarmingly severe.

3. The theories of etiology of nausea and vomiting of pregnancy are many and varied.

4. The types of therapy used are nearly as divergent as the theories of etiology.

5. Review of a series of fifty cases of nausea and vomiting of pregnancy is presented showing good results from treatment with estrogenic preparations in 96 per cent.

6. The dosage and effects on patients are given.

7. The theories of the rationale of using estrogenic preparations are discussed.

8. No definite conclusions can as yet be drawn from the small number of cases studied but a large percentage of good results in this group promises well for future reports.

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THE CHILD OF ANCIENT GREECE*

With Special Reference to the Pediatrics of Hippocrates

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GREECE has always held the predominant place in ancient history. It was from Greece that the sources of literary knowledge first flowed in a broad stream; it was in Greece that medicine was first put on a solid foundation. There was the cradle of eugenics, of philosophy, and of other branches of science. How did the child fare in this country?

As it is impossible to include all Greek knowledge concerning the child within the scope of this paper, I shall confine myself to the pre-Christian era. Most of my discussion will be devoted to the medical aspects of the subject, which are almost entirely covered by the *Corpus Hippocraticum*, Lycurgus and Plato will be considered for their work pertaining to eugenics, and Aristotle for his theories on heredity and the physiology of the newborn. Galen and Soranus, the pillars of later Greek pediatrics, will be omitted.

We have learned that it is insufficient to know only the anatomy and physiology, the pathology and therapy of pediatrics—the purely medical phases of the subject. We now appreciate the importance of the psychological and social factors concerned. Some space will be devoted, therefore, to the life of the child in ancient Greece, his social status, his education, and his pleasures.

The time of the Trojan War, as described in Homer's epics, was about 1200 B. C., and Homer himself probably lived between 1000 and 900 B. C. Lycurgus is to be placed about 800, and the Law of Gortyna about 500 B. C. Hippocrates lived from 460 to 377, and Plato from 427 to 347 B. C.; thus Hippocrates was thirty-three years old when Plato was born. Aristotle was only seven years old when Hippocrates died; he lived from 384 to 322 B. C.

As the *Corpus Hippocraticum* supplies by far the greater portion of the pediatric knowledge given here, a few remarks about Hippocrates are not out of place. According to tradition, Hippocrates is the author of the Hippocratic collection of medical works, the *Corpus Hippocraticum;* neverthless it has been definitely established that this collection is not the work of one man, but of generations of men. In its present form it was apparently collected and edited in the beginning of the third century B. C. This knowledge is not new; Erotianus, who lived at the time of Nero, recognized only thirty-one of the treatises as coming from the pen of Hippocrates, and Galen only thirteen. Later Hippocrates received credit for only two, and by some he is even denied credit for this number. At present, about six are considered to be Hippocrates' own work. The number of books contained in this collection has been variously estimated, usually as between fifty-three and seventy-two, depending upon whether some of them are considered as continuations of others. On the other hand, some were later divided.

*Read before the Ramsey County Medical Society, St. Paul, Minnesota, February 24, 1936.

like those on the eight-months and on the seven-months child, which apparently originally formed one book. The most popular number now is fifty-nine (Neuburger).[14]

Hippocrates, who really should be called "The Second," because his grandfather had the same name, was born and lived on the island of Cos. Many of the biographical stories about him are no doubt legendary. He became greatly honored even in his lifetime, and very early he became the shining light in medicine, the greatest of all physicians, the Father of Medicine. "He meant to medicine what Socrates meant to philosophy. Both represent the reaction of practical common sense against the overwhelming use of theoretical speculations" (Neuburger).[14]

Hippocrates apparently did not write a special treatise dealing with all children's diseases, but he did write a treatise which deals with a certain period of childhood, the period of dentition. It is called "On Dentition." This tract, however, does not deal exclusively with teething in infancy and childhood, in fact only seven of the thirty-two paragraphs do that; the rest deal with other pathological conditions, especially those of the throat. Some deal with the nutritional state of the infant, intestinal trouble, vomiting, etc. Several theories have been advanced to explain the purpose of this treatise. The most plausible seems to be the one claiming that dentition here means not teething alone, but all the ailments occurring during the teething period.

The "Aphorisms," probably the best-known treatise of the *Corpus Hippocraticum*, are of special value for us, as many of these aphorisms deal with children. There is a treatise "On the Nature of the Child," the title of which is misleading, as it deals with embryology. There are two treatises called "The Eight Months Birth" and "The Seven Months Birth," but it is questionable whether they are genuine, although it is agreed that they are of great antiquity. Besides this, children and their ailments are mentioned altogether in about two hundred places in the *Corpus Hippocraticum* (Ghinopoulo).[7]

Some of the embryological ideas of Hippocrates were as follows: The fetus sucks air and nourishment from the womb; the air is the same as that which the mother breathes, it gets into the heart of the fetus and is thus supplied to all parts. Hippocrates believed that the fetus takes food in utero. "If anyone asks," he says, "how one knows that the child draws and sucks in utero, one may reply that when a child comes into the world he is found to have feces in the intestines, and human beings and beasts directly they are born pass this through the bowel; moreover, if the child has not sucked in utero he would not know how to suck the breasts as he does as soon as he is born" (Still).[19] The number seven plays an important rôle in the development. In seven days the fetus has acquired all essential parts; forty hebdonads or seven-day periods (i.e., nine months and ten days) is the full time of pregnancy. The period of first dentition ends at seven years, or three hundred fifty hebdonads. The entire life is divided into seven periods, of which the first three are infancy, childhood, and adolescence (infancy here means the first seven years!). The significance of the number seven through the ages is well known. Even now many people think that our bodies change every seven years. This theory that the number seven has a special significance neither originated nor ended with Hippocrates.

Aristotle taught that after conception an undifferentiated mass develops, but that after forty days one can recognize in a male embryo in an abortive egg all limbs and the genitalia. In a female embryo no differentiation is noticeable even after three months, but after four and one-half months it begins to develop rapidly and soon catches up with the male. It also was his theory that the menses rise to the breasts and there change into milk.

There was more than one theory on heredity. Empedocles, Democritos, and Hippocrates thought that the male as well as the female has a seminal secretion. On this precept they built a theory of preformation. This theory was repudiated by Aristotle, and later he was upheld by Galen. Aristotle claimed that the greater likeness of the children to one or the other of the parents arises from the battle of the potentialities contained in the sperm and the menstrual blood, respectively. He thought that the uterus is filled with blood and that some kind of coagulation takes place when the sperm enters. He opposed the theory, originated by Pythagoras, that the semen derives material from all parts

of the body, that it is a kind of an extract of it.

Plato looked at the problem from a more practical standpoint. He claimed that the good results obtained in breeding cattle selectively for quality should be an impetus to try the same with human beings. It is not enough to educate the child properly; he must be properly born of select, healthy ancestry. He advocated permits for marriage. Men should procreate only between the ages of thirty and forty-five, and women between twenty and forty. He also proposed laws for the destruction of children born under circumstances contrary to his views. Similar ideas governed the laws of Lycurgus some centuries earlier.

Aristotle was the first to deal more intensively with the physiology of the newborn (Still).[19] For human beings and animals it is natural to be born head first. Human children have their hands pressed against their sides, but as soon as they are born they cry out and put their hands to their mouths. The infant does not cry until it is entirely born, even if in the course of a prolonged labor the head is born, and the body retained for some time. Evacuation of the bowel takes place at once or soon post partum, but always within the first day. The meconium is "like blood," very black, like pitch, but soon the evacuations become light because the infant nurses at once. For the first forty days the baby does not cry or laugh when awake, but he does both at times in his sleep. The newborn sleeps most of the time and usually does not even awake when tickled. The older he is the more he is awake. He had no doubt that even young infants dream, but that it is quite a long time before they remember their dreams. He stated that all newborn have blue eyes, later changing to their destined color.

Aristotle considered the division of the cord the province of the nurse. A woolen string was used for tying. When the cord is tied, it grows together and the adjoining part falls off. If the knot becomes untied the child dies of hemorrhage. It was the usual thing to wait a little and to tie the cord after delivery of the placenta except in cases where the placenta was not delivered for some time.

Prematurity was apparently a subject of great interest to the ancients. In Hippocrates' treatises on "The Seven Months Birth" and "The Eight Months Birth" is expressed the very ancient idea that the eight months child is much inferior to the seven months child. There is even the definite statement that none of the eight months children remain alive. The reason given is that there is a very dangerous period of forty days around the eighth fetal month, during which the fetus undergoes many kinds of ailments. Any child born in this period has no chance to live. The seven months child, on the other hand, may live, as it may be born before these diseases attack it, but even this child rarely remains alive. A child should be born at the end of the ninth month, and the so-called ten months child, that is one born after seven times forty days, is the very best, as it has had time to get over the supposed diseases in utero. Aristotle wrote that in Egypt it was claimed that eight months children may live, even if they are misshaped. This does not hold true for Greece, however, for if such an infant lives there the mother must be mistaken in her reckoning. A seven months premature baby that lived is mentioned even in Homer's *Iliad*.

Hippocrates mentions several signs indicating the condition of the fetus in utero. Flabbiness of breasts and abdomen and drying up of milk point toward death or lack of vitality. Hippocrates knew asphyxia of the newborn and advised against cutting the umbilical cord until the child cried or passed urine or sneezed. The child should be kept very close to the mother, probably for warmth. Aristotle also describes the pale, almost dead, asphyctic newborn. He tells that some nurses were particularly skillful in dealing with this condition; they squeezed the blood from the cord into the child and after that the pale child, which had been apparently drained of all blood, came to life again.

All kinds of congenital anomalies were known, such as polydactyly, congenital clubfoot, and luxation of the hips, situs viscerum inversus in animals, and hermaphroditism in human beings. Aristotle claimed that male children show such anomalies more often than female. He did not believe that maternal impressions cause monstrosities, and in this he was hundreds, if not thousands, of years ahead of his time. He said that there must be a physiological explanation, and he appealed to comparative embryology to solve the mystery.

Aristotle mentions the difference in the pro-

portion of the body in the infant and in the older child. According to him, the child starts to cut teeth in the seventh month, but occasionally it is born with teeth. Some get the upper teeth first, some the lower. He described the large fontanelle and claimed that it ossified later than any other bone. The rapidity of growth depends on the heat of the milk with which the child is nursed.

Homer notes that the nurse bathed the child in water immediately post partum, and wrapped it in rich swaddling clothes with golden bands; but we must not forget that Homer describes the aristocracy rather than the common people. At the time of Lycurgus, water was not used as in most countries, but the child was bathed in wine to prove its constitution. The idea was that epileptic and weakly babies would waste upon being thus treated, while the strong ones would become firm and tempered like steel. The law in Sparta required examination of the newborn by the elders. Well-shaped babies were raised, misshapen ones exposed. No swaddling clothes were allowed in Sparta, a singular achievement for the time; the children had to grow up free and unrestrained, and swaddling was considered a means of softening the infant. This, however, did not become popular in all parts of Greece. The Thessalians, for instance, had a special method of swaddling. A pillow filled with straw was put on a board that was like a shallow tub, the child was wrapped in linen and bands up to the hips, placed on the pillow, and tied down with straps pulled through special holes in the board (Soranus).[18]

Hippocrates has little to say about the care of the newborn. He advises that very small children should be bathed in warm water for a long time—very correct advice for probably premature infants. Not quite so correct is the advice to give them diluted warm wine to improve their color and to prevent convulsions. Some kind of wrapping-diapers are mentioned in one book. It was the custom almost always to place newborn babies in some type of cradle. Homer (Körner)[10] mentions a shield or a shoe-shaped cradle with two handles, or a winnowing basket; the latter was sacred to the gods and was regarded as a symbol of future wealth and prosperity. As the warlike Spartans wanted to condition their offspring very early, they used shields to take the place of cradles.

It is strange that Hippocrates says little or nothing about wet-nursing and the diet of nursing mothers and of wet-nurses—subjects which are considered at great length in all later Greek authors. For this reason it seems very probable that the collection is incomplete. Artificial infant feeding is not mentioned in the entire collection. Hippocrates claims that hard water reduces the amount of breast milk and he knew that when one woman's milk does not agree with an infant, another's may do so. The nurse's diet is considered in one passage, in which he declares that her faulty diet was the cause of lithiasis in infants. This is about all the *Corpus Hippocraticum* offers on the question of infant feeding.

In Homer's time, or in the time he describes, mothers usually nursed their babies, though occasionally wet-nurses were employed. Odysseus himself had been nursed by Eurycleia, whom his father had bought for one hundred cattle. Later she rose to high rank in the household. The wet-nurse had to suckle the infant until he could be fed honey and the juice of figs. The law of Lycurgus forced the Spartan mothers to nurse their babies. Nursing mothers were honored; they were greeted wherever they appeared and offered seats. How important nursing was considered is shown in the following story, though it may be only a legend: The seventh king of Sparta had two sons; the younger was chosen as his successor because the older had not been nursed by his mother, the queen.

At the time that Athens had reached the height of its power, wet-nursing became more prevalent, Spartan nurses being especially chosen because of the supposed beneficial influence of their sturdy natures. At first only the rich found nursing burdensome, but soon wet-nursing became almost universal. Usually slaves were used as wet-nurses. At times, respectable free women were forced by poverty to do this work, although many wet-nurses were of very doubtful reputation. At times a very nice relationship developed when the nurse stayed on in the household and took care of the older child and later became the confidante of an older girl or even attained the responsible position of housekeeper. Poetry and art give many ex-

amples of such relationships, and there are several gravestones dedicated to such faithful nurses. Many terra cotta figurines show women with nursing infants.

In agreement with Hippocrates, Aristotle attributed diseases of infancy to faulty diathesis of the nurse. Probably neither of the two is original in his opinion, but this is no doubt an idea which was ancient at the time of Hippocrates and Aristotle. Although we find nothing on artificial feeding in Hippocrates or any other Greek author, there is no doubt that it was practiced. Heinrich Schliemann,[16,17] who excavated the site of ancient Troy about sixty years ago, found several small vessels with spouts which he thought were used for feeding infants, and recently more were unearthed at the same spot.[1] There are other vessels preserved which no doubt were made for this purpose, some of which are shaped like teapots,[3] others like urns. Some have sieve arrangements on top to keep out coarse contamination, thick scums, and the like. After a year the child received some broth made of pulse, sweetened with honey; then barley, porridge, and goats-milk. Hippocrates recommended diluted wine for children, but Aristotle condemned it. Our information concerning the diet for young children is very meager.

Our knowledge of pediatrics proper, the pathology and therapy of children's diseases, over two thousand years ago is almost entirely drawn from the *Corpus Hippocraticum*.[6,7,19] Aristotle's remark that the majority of infants die before they finish the first week of life gives us a deep insight into infant mortality. The philosopher points out that infants usually were not given names until they had reached the age of a week, when there was some hope of saving them.

Nutritional disturbances in infants are considered in greater detail by Hippocrates than by any other ancient medical author, but the basis for many of his ideas is difficult to understand. He knew that the mother's physical condition often influences the fetus, as a weakly child is usually born of a sickly mother, one who suffers from fever, urinary disturbances, etc. The viability of the newborn is mentioned about twenty times. The treatise on dentition deals with feeding and nutrition in ten places, e.g.: "Children who are well nourished by nature do not nurse a quantity of milk corresponding to the increase of flesh." "Children who have large evacuations and good digestion are the healthier, and those who have small evacuations and know no limits [in their eating] are not nourished in proportion and are sickly." He knew that the various ages have different dietary requirements, because "the growing organism has the most innate heat, and therefore requires more nourishment." In a famous aphorism he tells that elderly people bear fasting well, but infants fast poorly, especially those of a lively disposition. There is mention of some dysentery with sleepiness; this might be intestinal toxicosis or cholera infantum, but for the low mortality. The crisis is on the eleventh day. Liquid diet he considered proper in all febrile diseases, especially in children.

Hippocrates held the influence of age, constitution, and season of the greatest importance upon the origin and course of disease. Four of the aphorisms deal with the diseases prevalent at the different ages. "The diseases of infants are: aphthæ, vomiting, wakefulness, nightmares, inflammation of the navel, discharges from the ears." At teething time, children often suffer from pruritus of the gums, fever, convulsions and diarrhea, especially when cutting the canine teeth and particularly in fat, constipated infants. "A little later there are tonsillar infections, crick of the neck, asthma, calculus, round and other worms, pedunculated warts, scrofula, tumors about the ears and elsewhere" (probably adenitis), and urinary difficulties. "At the appearance of puberty, epistaxis and chronic fevers supervene," besides the diseases just mentioned. "As to the ages," he says, "the youngest ages are the most susceptible to disease." In discussing the influence of seasons, Hippocrates declares that "children are more comfortable and healthier in spring and early summer." "Most diseases," he claims, "come to the crisis within forty days, some within seven months, some within seven years, others when the individuals reach maturity. If boys are not cured by fifteen years and girls not by the time they begin to menstruate, they will continue [with their sickness] all their life." The age of the patient should be considered when making the diagnosis and the prognosis. Hippoc-

rates claimed that the constitution of an individual does not change—which sounds quite modern. He knew of the late appearance of menses in colder climates.

Rachitis is not mentioned in the entire *Corpus Hippocraticum*, and there is no condition described which may be diagnosed as such. The kyphosis that Hippocrates describes is probably of tuberculous origin. In Homer we find a figure by the name of Thersites, a kind of court jester, who had bowlegs, was hunchbacked, and had a deformed chest.[5] Many authorities considered these severe deformities due to rickets, in spite of the fact that the jester was lame on one foot; this lameness, however, may have been due to skeletal deformities. You probably remember the bust of the immortal writer of the well-known fables, Æsop. He was a hunchback, and he showed marked deformity of the entire thorax. It is possible that he was a severely rachitic individual in early childhood. In Plato we find a passage which seems to point to the fact that rickets was known in ancient Greece. He proposed that nurses should be compelled, under heavy penalty, to carry children until they are able to stand, and even then care should be taken that the children's limbs are not distorted by too early weight-bearing; they should be compelled to carry the children until they have completed the third year. So far, no evidence of rickets has been discovered in the excavated skeletons of ancient Greece.

Here may be inserted the question of dentition. Only seven paragraphs in the treatise bearing this name are devoted to the subject. Some seem rather strange. "Those who have acute fever during dentition rarely have convulsions." "Those who cut the teeth in winter get along better if the conditions otherwise are the same." Hippocrates knew that "not all children die that have convulsions during teething, many stay alive," et cetera. Of mouth diseases, noma is carefully described. Of ear diseases, otitis with earache is described, and delirium is considered a dangerous sign. In those with ear discharge, the prognosis is better. Hippocrates knew mastoiditis. Eye diseases in children are mentioned here and there. Nyctalopia (day blindness) attacks children and youths; it heals spontaneously, in some in forty days, in others in seven months, or it may even last a year. Hippocrates knew trachoma, acute and chronic conjunctivitis, sties, and others. In other words, he was familiar only with external eye diseases, as can be expected. Among the tablets found in the Asklepieion of Epidauros, one deals with a blind boy who was healed by being licked by a dog. A diagnosis is not easily possible.

Diseases of the throat, usually of an ulcerative type, are frequently described. Hippocrates distinguished mainly two types: a milder one, the synanchis, is probably a nasopharyngitis; and a severe, malignant one, the kynanche, probably diphtheritic croup.[7] He considered children after the period of dentition particularly susceptible to throat infections. "If the child is able to swallow," says one passage, "he will recover from the tonsillar ulcerations." If not, the disease will prove fatal (this is probably a peritonsillar abscess, and not a diphtheritic paralysis, which, by the way, apparently was known to Hippocrates). Many other passages could be quoted, but they are of less importance. Tonsillitis and what we consider to be quinsy were treated with warm compresses; incision of the abscess in the throat is mentioned, though not specifically in children.

Of respiratory diseases, we find asthma in children mentioned briefly. A cough usually was the whole clinical picture of a respiratory disease. Children develop coughs especially in March, when the so-called "Bird Wind" blows, a cold north wind that frequently springs up at the time the birds begin to return from Africa. This was the reason that March was greatly feared. It is interesting to know that Hippocrates recommended for the treatment of coughs an eggnog-like drink containing, among other ingredients, egg yolk and honey. When breathing was difficult he prohibited baths, just as many of our mothers refuse to bathe children who have colds. There is a description of empyema in a child whose chest was opened by means of a cautery. Strange is the history of two older boys who were attacked by a dry, violent cough; a paralysis of the right hand occurred, after which the cough stopped.

Circulatory diseases are very poorly dealt with; since sufficient anatomical and physiological knowledge was lacking, heart diseases were practically unknown. Hippocrates thought that

the heart was too tough an organ to become diseased or cause pain.

In discussing diseases of the intestinal tract, Hippocrates declares that diarrhea often complicates teething, but that constipated children have more trouble from teething. Parasites are well described; he mentions the round worm, the ascaris, and the flat worm, the tenia. The tenia originates in utero, because at times the grown parasite is found very early post-partum with not enough time to allow for such development. Round worms reproduce themselves, but teniæ have no young. The tenia is as long as the intestines; purging produces only part of the worm, pieces of which may be passed with the stool or even when walking. All of this sounds unusually modern. Hippocrates thought, however, that the worm impinges against the liver, causing dribbling, aphonia, jerking sensations in the abdomen, and pain. He describes prolapse of the rectum occurring from diarrhea or passing a calculus in children. He recommends the following treatment: replace the rectum with a soft sponge, the child being suspended in a certain manner. In obstinate cases the rectum is moistened with some decoction and (after replacement) the anus is compressed by means of a bandage passing around the abdomen and between the legs. At stool the child sits with its back against the mother's knees, its feet upon her feet.[6] Dysentery is described with fever, peculiar multicolored stools (probably containing blood and pus), anorexia and thirst. The mortality from this disease was high between the ages of five and ten years. Constipation is treated with goats' milk and honey, or flour-water with honey and olive oil, and also with enemas and suppositories.

Urinary diseases are mentioned in some of the earliest medical records relating to children. We find them noted in some of the oldest Egyptian papyri. Calculus apparently was more prevalent in ancient times, and Hippocrates mentions it often; older children develop stones in the bladder on account of the heat in that organ. Such children rub and pull their genitals because they think that the obstruction is there. It is much rarer in girls because of the shorter and wider urethra and because they supposedly drink more water. One of the causes is unhealthy milk. A preventative is wine, much diluted. There are five ardinal symptoms: pain on urination, emission of urine drop by drop, bloody urine in cases of ulceration of the bladder with reflex pains in the prepuce, and occasionally passing of gravel. Among the tablets found in Epidauros there is one dedicated to the cure of lithiasis in a boy. Hippocrates knew cystitis with fever, which often was fatal. Besides the cloudy urine and diarrhea or constipation, there was pain in the bladder region.

As to the genitals he made one blunder, but the same was made much later; he considered the hymen a pathological product. Hippocrates was the first to describe the orchitis complicating mumps. He knew the hydrocele, or "dropsy of the testicle" in little children, and taught, properly, that it often disappeared spontaneously.

Skin diseases are mentioned fairly often, but at times it is very difficult to come to a definite conclusion as to the diagnosis. Hippocrates mentions herpes, pityriasis, erythema, erysipelas. Skin diseases are the result of the deposition of the materia peccans in the skin, i.e., they are caused by internal ailments. This deposition in the skin is a natural healing, and one should not interfere with it or the deposits may be "driven inwards" and aggravate the underlying trouble, an idea which is still prevalent. From this theory are derived the names: exanthema = blossoming; ektoma = efflorescence; and ekthyma, the root of which means to break forth.[7] A toxic erythema or urticaria is mentioned in a case of dysentery; the rash soon disappeared, and there was also swelling next to the ears, which, too, soon disappeared.

Of infectious diseases he knew diphtheria. Several aphorisms apparently deal with it, and in the treatise on dentition he mentions spider-web-like coverings on the tonsils besides ulcerations, which were considered unfavorable. The following is an important passage: "Ulcerations on the tonsils that spread about the uvula usually alter the voice of those who recover." Brettoneau did not consider the evidence sufficient for a definite diagnosis, but at the present the alteration of the voice is considered a post-diphtheritic paralysis of the soft palate. Hippocrates gives an excellent description of an epidemic of mumps on the island of Thasos. Often a simultaneous swelling of the testicles was noticed.

We may suspect typhoid fever in a disease with meteorism, swelling of the spleen, and yellow stools, which lasted three weeks. There was abscess formation during the convalescence. Dysentery was described before. Tetanus is mentioned several times.

Tuberculosis is represented by what apparently is Pott's disease, and perhaps tuberculous arthritis. In speaking of kyphosis of the spine, he says: "Those who acquire it before puberty from asthma or cough will die."

Neurology is treated at length, an entire treatise being dedicated to epilepsy alone. "The grownup epileptic has the aura, and when he feels the spell approaching, he hides somewhere because he is ashamed; a child will fall down at first, but later he learns to recognize the aura and runs to the mother or another person he knows well, because of fear and terror, not because he is ashamed, as the sense of shame is not yet developed in the child." The cause is a congestion of the veins by phlegm, which is not carried off properly. Only in a phlegmatic constitution does epilepsy appear. A certain purification of the brain takes place in utero, toward the end of pregnancy, by giving off phlegm. After birth, sores on the head help in this cleansing process, also dribbling. This may suffice as the etiological explanations are very lengthy and of no further value to us. Localized collections of phlegm are thus responsible for the convulsive seizures of certain limbs, the mouth, eyes, et cetera. Little children die easily. Hippocrates was probably the first to reject supernatural causes which gave the disease its name, *"hiera nosos," "morbus sacer,"* the sacred disease, and he also recognized it as a cerebral affection. He distinguished it from convulsions of other origin, although, like most medical authors after him, he was not quite sure where to draw the line of distinction, but that would be asking too much. He apparently knew that epilepsy is hereditary. He considered it curable before puberty, but not afterwards; the cure is brought about by changes, such as age, location and mode of life. Very interesting is a passage stating that epilepsy and quartan fever are not compatible, that patients suffering from quartan fever do not develop epilepsy and if an epileptic develops this fever he will be cured.

Convulsions in children are mentioned often. He recognized the relation of fever and convulsions and knew that they do not always prove fatal. Besides fever he noted, as causes, constipation, wakefulness, and fright. "They occur most readily in children from just after birth up to the seventh year. Older children and adults are much less prone to develop convulsions, unless a violent, fatal disease with delirium is present." He mentions convulsions during dentition, several times.

Hippocrates was the first to give a perfect description of breath-holding spells, although he related it to epilepsy. "The onset may be from some mysterious terror or fright from somebody shouting, or in the midst of crying, the child is not able quickly to recover his breath, as often happens to children; but when any of these things happen, at once the body is chilled, he becomes speechless, does not draw his breath . . . the blood is at a standstill . . ." (Still).[19]

He was also the first to mention cerebral palsy in children: "When weakness is left," he claimed, "the spells frequently do not recur" (as they do in epilepsy). He described atrophy following paralysis, also as consequences of disease of the spinal cord. He also seems to have known lethargic encephalitis, and he was well aware of the fact that in head injuries the convulsions occurred on the contralateral side.

Aristotle discusses a condition called ischnophonia, seen particularly in young individuals, where the patient cannot put the syllables together fast enough—probably stuttering or stammering.

An interesting case is reported in the collection from Epidauros. A boy who had lost his voice went there to recover it. After offering the initiating sacrifices and going through the usual procedures, the official who carried the fire for the temple sacrifices looked at the father and said to him: "If you accomplish your purpose, will you pledge yourself to give this temple, every year, a certain sum in grateful memory?" And before the father could say anything, the boy answered in the affirmative and was cured of his affliction—no doubt a hysterical mutism.

Hippocrates' surgical experience must have been enormous, as even among children the variety of conditions upon which he reports is remarkable. There are some excellent case

histories of head injuries. A boy was hit on the head with a broken pot thrown by another child. On the twelfth day fever developed, caused, as Hippocrates thought, through irritation of the wound produced by washing it. The edges became swollen and the skin seemed to become thin in all directions. Thepanation was performed, but no pus was encountered. There seemed to be evidence of imminent suppuration in front of the ear on the same side though there was no real breaking down. Later suppuration of one shoulder developed. Death occurred on the twenty-fourth day. This was, unmistakably, a case of pyemia following wound infection.

A twelve-year-old girl received a head injury when a door was slammed in her face, fracturing her skull. The fracture involved some sutures. Trepanation was done, but as it was done poorly, suppuration took place. On the seventh day she had a chill, then fever and chills for eight days. The trepanation was repeated, but only a little blood and pus were found. The girl became somnolent and high fever continued; finally left-sided convulsions (the wound was on the right) and exitus occurred.

Hippocrates reports an abdominal injury from a mule kick, followed by rapid respiration, unconsciousness, fever, and exitus on the fourth day. It is hard to make a definite diagnosis, but here, as in the previous cases, we must admire his honesty in reporting them.

He mentions suppuration of the parotid glands, in some cases three days post partum—our suppurative parotitis of the newborn. Gangrene of the mouth, noma, was well known. One boy lost the lower and upper front teeth and part of his jaw. Hippocrates noted that at times part of the palate is destroyed and that the tip of the nose becomes flattened when the upper front teeth fall out.

Several orthopedic conditions are well dealt with. Pott's disease was mentioned. Hippocrates described suppurative arthritis in hip and shoulder, with pathologic luxation. Two cases of suppurative arthritis in children occurred late during some disease with a dry cough and digestive disturbances—perhaps of tuberculous origin. He seems in his proper element when describing various luxations and their treatment. He described congenital hip luxation, congenital anomalies of the spine, and clubfoot. About the latter he said: "In congenital clubfoot a cure usually can be brought about if the treatment is started early." When the child wears shoes, they should be of a type which, judging from the etymology, were used for walking in very muddy streets. Such shoes probably grasped the foot up to the ankle. Another kind recommended was the so-called Cretan shoe, a sandal fastened to the foot by leather straps reaching as far as the middle of the leg, higher than usual.

Sufficient evidence has been produced to show that in pediatrics, as in other branches of medicine, Hippocrates was a master physician and was far ahead of his time. We can justly apply to him his own words: "Old medicine should not be thrown overboard as if it never existed . . . because it is not perfectly correct in everything. No, the opposite should be done; because it comes so close to the truth we should still consult it and admire its discoveries in spite of the many errors."

One would think that in Greece, where art, poetry, and philosophy were developed to unsurpassed heights, children would be given all the care and consideration that might be expected of a highly civilized nation. That this was not so is excellently expressed by Payne[15] in his outstanding work on the history of child welfare: "The theory that philosophy and religion go hand in hand with humanity is shattered by the fact that Plato, Aristotle, Confucius and Gautama affected apparently not a single jot the ancient attitude of indifference toward the undesired children." And again: "While the Greeks treated women well, yet with the exception of the single province of Thebes, infanticide was common in all Greek states."

It is true that in the two great poetic works of Homer, evidence of cruelty toward children cannot be found except perhaps in the story of Hephaistos, the heavenly smith, who claimed that his mother tried to conceal him because he was lame. Much has been written on this apparent discrepancy, because humanity in such a degree is not apparent in Greece from Homer down to the Christian era, a period of about a thousand years. Practically every Greek colony had a legend of a hero who had been exposed there, and Greek mythology is full of similar stories. Even Jupiter was such a victim, and was saved by a goat that nursed him. I am

sure you are familiar with the laws of Lycurgus, ordering the exposure of all weakly and deformed children in a chasm beneath Mount Taygetus. Lycurgus practiced eugenics "without regard for conventional morality."[6] "Children were not so much the property of their parents as of the whole commonwealth" (Plutarch). Plato considered only eugenics, and infanticide, as far as it fitted into his theories, was in no way objectionable. Of actual laws concerning the child, besides those of Lycurgus, I want to mention the laws of Gortyna in Crete, which date from about 500 B. C. and consider the social status of the child, particularly the right of the father over life and death of his child.

Even more evidence of cruelty toward children, particularly the newborn, we find in many ancient literary works. Besides economic pressure, all kinds of reasons were used to get rid of unwanted offspring, for instance, doubtful parentage. Many a mother tried to counteract the forced exposure of an infant dear to her heart; near the child she left a pot or crock containing money and jewelry, hoping that some poor people would have pity on the infant when they found the valuables. The jewelry also might serve for later identification. This was, of course, a splendid theme for many dramatists, and the appearance of the supposedly dead child, now grown to manhood, and the highly dramatic identification made an ideal fifth act.

One of the economic reasons for restricting the number of children was the desire not to split up the estate into too many parts. The province of Thebes alone condemned exposure by law. Ælian wrote about it as follows: "This is a Theban law, most just and humane: that no Theban might expose his child or leave it in a wilderness, upon pain of death. But if the father is extremely poor, the law requires that as soon as the child is born, whether it is male or female, it must be brought in the swaddling clothes to the magistrate, who, receiving it, delivers it to some other for a small reward, conditioning with him that he shall bring up the child, and when it is grown up, to take it into his service, man or maid, to have the benefit of its labor in requital for its education" (Payne).[15]

But besides economic or other somewhat dramatic reasons, there prevailed at times an inexcusable cynicism in regard to children. "There is nothing unfortunate in being a father unless one is the father of many children," declared one writer. A Greek poet said: "Nothing is more foolish than to have children." A philosopher said: "To raise children is an uncertain thing, success is attained only after a life of battle and disquietude" (Payne).[15]

In spite of all this there is a brighter side. Children who were kept were treated well and were given every opportunity to develop into young people who would be the pride of the country. The Greeks seemed fond of the children they decided to raise. There are many figurines showing dandling, bathing, and fondling of infants.[20] Homer delights in describing rich swaddling clothes and cradles, and Aristotle speaks of lullabies for babies.

In Sparta the early education of the child was rather strict. Children were fed simple food. They grew up without fear of the dark or of being left alone, and were not spoiled. To show pain was considered a disgrace. The Spartans had a definite plan in conditioning the entire youth for endurance, starting at a very early age. Up to seven years, male children were kept with the women, from seven to eighteen they were called "boys" and underwent a strict routine. Their education was mainly physical, consisting of training in running, leaping, wrestling, boxing, and other athletics, and was conducted in the gymnasium. Dancing and military exercises finished their education. At certain festivals, flogging of boys was practiced to show their endurance of pain. Girls, too, wrestled, ran races, threw quoits, cast spears, and danced in the nude in public. There was no prudery in their upbringing. Lycurgus thought he could produce heroic minds in youths by the practice of music.

In Athenian Greece the boys were sent to school at seven, usually escorted by a pedagogue, a male slave with some education. They were taught reading, writing, and arithmetic, drawing, music, and simple geometry. Physical culture was held in high esteem; wrestling, running, and spear throwing were taught. There were special races for boys at the Olympic games. At eighteen, boys were enrolled in the city tribe to which they belonged and usually became soldiers.

Aristotle and Plato were much concerned with

the mind of the growing child; both suggested censorship of fairy tales and legends so that immoral and pernicious parts might be omitted. Children were taught reverence for their elders, probably an inheritance from the Egyptians.[11,12]

The saying that "all work and no play makes Jack a dull boy" is by no means new. Aristotle and Plato pleaded very urgently that one has to rest in order to work with renewed strength, and play gives the mind rest and entertainment. Plato, therefore, considered games necessary in order to make children strong for real life; if supervised correctly, he said, games are good for the body and the intellect. He believed that the state should supply playgrounds and supervise games. You see we are not so very far ahead of him.

What games did Greek children play? Very popular were ball games, which surely go back as far as Homeric Greece. There was one such ball game that was called Urania, from the Greek *eis ton uranon*, "to the sky." Perhaps it was the game in which one player throws a ball very high while another jumps in the air and tries to catch it before he touches the ground. In one game the loser had to carry the winner on his back and was called an ass. The fact that the Greek mind is very inventive is illustrated by the variety of games that these people played. The Greeks used hoops, peg-tops, the see-saw, the swing, the kite, the hobby horse, and the go-cart. That a game similar to hockey was played is shown in a well preserved relief. The game that apparently was dear to every child's heart was that played with the astragaloi, the knuckle-bones of sheep. We find it frequently represented on vases. It was similar to our game of "jacks." There were many other games that were free from exertion, such as dice, checkers, draughts, and parchesi.

The Greek child did not lack toys. Many examples have been found, showing us how the children of ancient Greece played. In the ruins of Troy[16] several rattles were found, some of human form. Later rattles were made in the form of pigs. There are many figurines of different animals, especially horses, and no doubt some of them served as toys. Children played with dolls, some of which were rather crude, but others were jointed and exquisitely executed dolls which would gladden the heart of any modern child. Evidence that children had live pets is shown in the pictures on many ancient vases.[2,3,9]

The pediatric achievements of ancient Greece go hand in hand with the other medical achievements of the time. The social status of the child was far from our conception of the child's status in a highly civilized nation. But education was relatively well developed and the seeds of certain ideas of child psychology and child management, of which we are so proud, are to be found in the time I have tried to bring nearer to you.

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CASE REPORTS

PITUITARY BASOPHILISM WITHOUT ADENOMATA ANYWHERE*

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A WOMAN of forty-four entered the hospital, February 11, 1935. She gave a history of polydipsia, polyuria and glycosuria since May, 1934. Hirsuties requiring depilators had developed since January, 1934, and there was obesity of many years duration. Dyspnea, orthopnea and edema of the ankles had existed for six weeks. She had pain in her left hip at times. She had had one attack of muscular spasms of the extremities without loss of consciousness.

Her past history entailed mumps, measles, smallpox and chickenpox as a child, diphtheria at nineteen, and pneumonia at thirty-one. At twenty-one she had submitted to an appendectomy and right ovarectomy. There had been vague headaches and discharges from the left ear when she had a cold. She began her menses at fourteen, which were regular with dysmenorrhea. She was married and had a daughter twenty-one years old. Her husband is living but not in good health. She had been amenorrheic for one year. Her family history is negative.

Physical Examination.—Her height was 5 feet 1.5 inches, her weight 192.5 pounds. She had a characteristic moon face of reddish cyanotic hue. There was a growth of hair on the face, excessive under the chin. The skin was dry, especially on the face and upper extremities. The neck was thick and short, the body was fat, while her arms and legs in proportion were rather thin. The breasts were heavy and pendulous. The abdomen was protuberant and fat, with purplish striæ on the sides and brownish striæ over the lower portion. There was a healed operative scar in the right lower quadrant and no masses nor organs could be made out. The lungs were clear. The heart was enlarged to the left; no murmurs were present, with a blood pressure ranging, during her stay of 104 days, from 210 millimeters of mercury systolic and 130 diastolic to 140 systolic and 92 diastolic. The neurological examination was essentially negative. Gynecological examination reported a normal pelvis. Her eye grounds showed moderate hypertensive changes. There was no aural discharge on the left. No audiometric readings were made.

Laboratory Studies.—The urine showed marked glycosuria. The hemoglobin ranged from 70 to 80 per cent. Her reds averaged 3,800,000, her whites showed a leukocytosis, at times, up to 15,000 and 20,000. There was marked hyperglycemia. Her sugar tolerance curve showed delayed return. The Friedman test for pregnancy was negative. Her calcium and phosphorus levels were normal. Her cholesterol level was 327.9 mgm., her chlorides 519.5 (2-27-35). Plasma protein was 5.83, of which albumin read 3.48, the globulin 2.35. Potassium (2-27-35) and sodium estimations were 14.7 and 361.9, respectively. The CO_2 combining power of the plasma was always above the normal, ranging from 84 to 104 throughout her stay. There was no free hydrochloric acid with histamine.

X-ray studies revealed a moderately enlarged heart to the left, pleural thickening on the right side. Pelvic bones, femurs and vertebræ appeared normal. The sella turcica showed a distinct rarefaction of the dorsum sellæ. There was no evidence of enlargement. Her perimetric estimations were normal. Intravenous pyelograms showed normal kidney shadows and there was no evidence of any abdominal tumor. The mastoid shadows revealed a chronic sclerotic bone on the left.

She was placed on a 780 caloric diet with 110 units of insulin per day. This gradually controlled her glycosuria. At the terminal period of her stay she was on 1,100 calories per day with 35 units of insulin per day. At no time did she show any ketosis. Her cardiac incompetence cleared under rest. The high CO_2 combining power without any clinical evidence of alkalosis was due to some unexplained mechanism. Insulin increased the alkalosis. Sodium and cortin had no effect. Giving potassium chloride increased the chloride and potassium to normal. Following the unadvised extraction of a tooth, the patient developed a hemolytic streptococcemia and died in two days.

The post mortem findings[1] can be summarized:

Dense pleural adhesions on the right. The heart weighed 400 grams. Coronaries were soft and patent. The lungs showed a terminal branchopneumonia on the left. The liver weighed 1,900 grams and showed a fatty cast. The gallbladder was thickened and contained six small stones. The gastrointestinal tract was, negative. The pancreas weighed 80.2 grams—no adenoma present. The left adrenal weighed 14 grams, the right 12.4 grams. No definite adenoma on the gross. Each kidney weighed 250 grams. There was cloudy swelling. The capsules stripped readily. They showed a few hyaline glomeruli and there was a mild degree of arterio- and arteriolar sclerosis.

The right ovary was not found. The left ovary weighed 7.4 grams and showed no tumors. The uterus measured 7 x 6 cm. and was not myomatous.

Thyroid weighed 19 grams and showed no hyperplasia or adenoma. The follicles appeared normal. Attached to the posterior capsule were two ovoid bodies about 3 mm. in the long axis. These proved to be parathyroid on microscopic section and showed large fatty cells, nests of pale and dark oxyphilic cells. Chief cells occasionally contained fat droplets. There was an occasional Wasserhelle cell.

The pineal body was normal in size and appearance. The sella turcica showed no erosion. The hypophysis weighed 0.6 gram and was normal in size and appearance. Histologically[4] there was no appreciable invasion of the posterior lobe by basophils. It was essentially normal with reference to number and size of basophils. There was more than usual vacuolization of the basophilic cells.

The adrenals showed no adenoma.

Since Cushing's[3] original communication, the clinical similarity of his syndrome and that found associated with suprarenal cortical tumors and that found accompanying neoplasms of the thymus has been repeatedly emphasized. Only in the more obvious cases could one say clinically which of these three organs was the anatomical center of the picture. All who have tried to explain which organ with its known hormones had anything to do with the production of such a remark-

*Presented before the Minnesota Society of Internal Medicine, Nov. 11, 1935.

able constant clinical syndrome soon found themselves in a maze of contradictory evidence. In the present case no tumor of any kind in any organ has been established. This calls for a reconsideration of the whole mechanism. Where is the common denominator in this highly interesting syndrome? Crooke[2] thinks he has found this common denominator. In a case with a tumor of the suprarenal cortex having symptoms attributed to a basophil adenoma of the pituitary and called pituitary basophilism, he found a change in the basophil cells which had not been described before. Search in twelve other cases of so-called pituitary basophilism, six of which had pituitary basophil adenoma, three with suprarenal cortical tumor or hyperplasia, and three with thymic neoplasms, all showed similar findings in the basophils of the pituitary. This change consists of the appearance of a hyaline-like substance in the cytoplasm brought out by special stains, which to him is an indication not of a degenerative process in the cell but an evidence of a changed function. Scrutiny of 350 other pituitaries from various types of cases not exhibiting basophilism revealed in contrast to the marked hyaline changes in the basophils of the basophilism cases only slight hyaline changes in nine cases: three cases of Bright's disease (with no cardiovascular hypertrophy), renal tuberculosis (1), disseminated tuberculosis (1), septicemia following abortion (1), bronchopneumonia complicating acute appendicitis (1), carcinoma of the stomach (1), carcinoma of the rectum (1). So few were the cells involved in this group that prolonged search was necessary to find them. Hyaline changes were absent in all the others. In the case reported today there is no evidence of any adenoma or neoplasm in any endocrine organ or any other type of tissue. Examination of the basophil cells by Crooke revealed the same hyaline change most profusely. Going back to the case reported by me before the Pathological Society and also before the Minnesota State Medical Association in 1934,[5] in which a large basophilic adenoma of the pituitary was demonstrated without changes in any other of the endocrine glands, this hyaline change was again demonstrated. In a case on the Pediatric Service which had all the physical and clinical data resembling basophilism but which had a malignant tumor of the suprarenal cortex with metastases to the liver, the hyaline change in the basophils of the pituitary was also present. This brings the number of cases with Crooke's hyaline change up to fifteen, of which we at the University of Minnesota have knowledge. Crooke was unable to demonstrate this change in four cases of basophilic adenoma without basophilism. While more work must be done, the supposition that this variation in the basophils is a common denominator instigating the clinical picture of basophilism seem justified. Crooke's finding has pushed the controversy as to which gland is the center of these

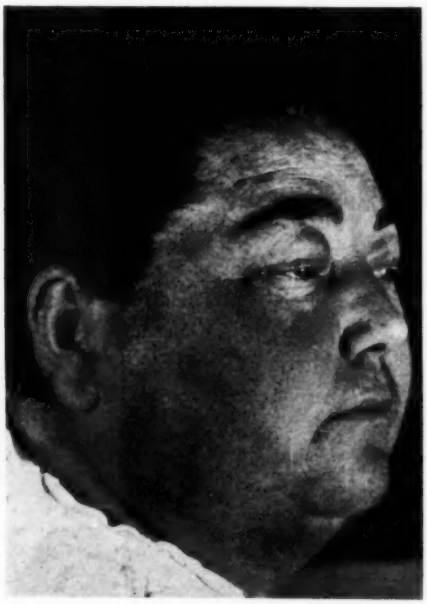

Fig. 1. Close view of patient showing hirsuties of face.

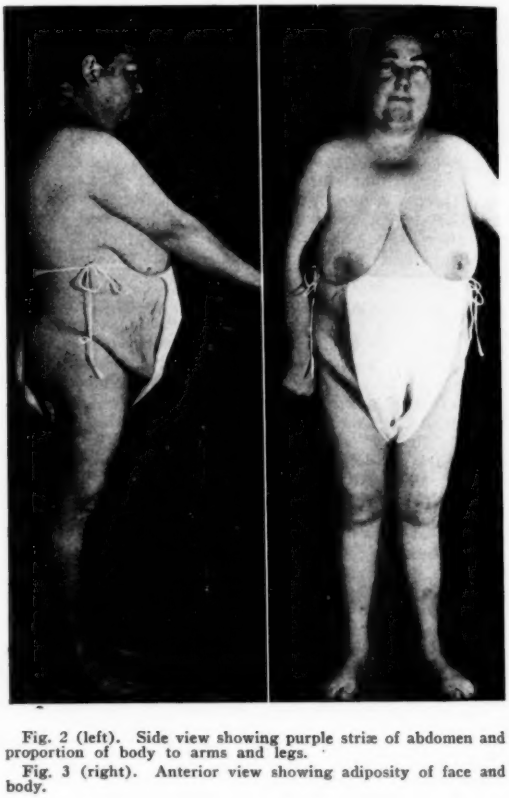

Fig. 2 (left). Side view showing purple striæ of abdomen and proportion of body to arms and legs.
Fig. 3 (right). Anterior view showing adiposity of face and body.

abnormal physiological processes to cytological changes in a specific type of cell, i.e., the basophils of the pituitary. In time it is quite possible that Cushing's term basophilism will be justified.

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SARCOMA OF THE OVARY

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SARCOMA of the ovary is a very unusual and rare condition constituting, according to Stacy,[11] 4 per cent, and, according to Kroemer,[8] 5 per cent of ovarian neoplasms. Jaisohn,[7] in reviewing the available bibliography on this subject in the Surgeon General's Library, found only twenty-four cases from 1888 to 1915, including those cases reported from Austria, Cuba, France, Great Britain, Germany, Russia, Sweden and the United States. According to Boyd,[3] the age period is much earlier than that of carcinoma and is not uncommon in children. Stacy[11] states that sarcoma of the ovary in children occurs most frequently under the age of five years. Bland-Sutton[2] collected sixty cases of ovarian growths in children under fifteen years of age, of which 26.6 per cent were sarcomas. Wiel[12] in sixty cases of ovarian growths in children under ten years of age found 25 per cent sarcoma. Bates and Sincerbeaux[1] reported a case of sarcoma of the ovary in a child ten months of age, while Doran[4] reported a case of bilateral ovarian sarcoma in a premature of seven months, which died very soon after birth. Hoyd[6] and Schwarz[10] each report a case of sarcoma of the ovary in patients of twenty-three months of age, both being bilateral.

Pathology.—Such tumors may be of the spindle cell type and of a firm consistency, or, more commonly, of the round cell type and soft. Other histological varieties include the myxosarcomas and chondrosarcomas. Metastases are abundant and ascites a frequent accompaniment. These masses grow rapidly, may be unilateral, but more commonly are bilateral, usually smooth and occasionally nodular. They are found in the lower abdomen on one side or the other and are freely movable.

Symptoms

The most common evidence of the presence of such a neoplasm, in a child, is the recognition of the tumor mass, either plainly observed or accidentally discovered, as its presence is made manifest by pain, frequently acute and often the result of a twisted pedicle, or due to a distended abdomen or pressure interference with some abdominal organ. Such pressure symptoms may result in diarrhea, constipation, vomiting, urinary disturbances or in intestinal obstruction of an acute type. While sexual precocity may or may not be present, precocious menstruation, enlargement of the breasts, development of pubic and axillary hair, precocious development of the external genitalia and enlargement of the uterus should serve always to attract one's attention to the possibility of an ovarian growth. In this regard, it might be well to quote Novak, of Baltimore,[11] as to the definition of precocious menstruation, which is as follows: "If menstruation begins and recurs regularly in a girl of 9 years, in this climate, it must be looked upon as precocious."

Diagnosis

Diagnosis is seldom made before operation. However, the discovery of a mass, usually in the lower abdomen, single or bilateral, usually freely movable and accompanied by ascites, should give a clue. Rectal examination should never be omitted.

Treatment

Removal by surgical operation, in favorable cases, is the treatment of choice; radiation is indicated in the less favorable cases.

Prognosis

According to Wiel[12] and Stacy,[11] the prognosis is less favorable in the young than in the adult, in whom the spindle type of growth is more common. Hoon[5] in reveiwing the literature found that from 80 to 90 per cent of children operated upon for this condition died within 6 months to one year.

Case Report

On November 3, 1933, at 9:30 a. m., there entered on my hospital service a white female child, nine years of age, with the complaint of a generalized abdominal pain. Her present distress began at 6 o'clock that morning, at which time she was awakened from her sleep with a severe pain throughout the abdomen, later localizing in the lower right quadrant. Her mother related that the child lay in bed with her knees drawn up, with pain over the abdomen, and that nausea but no vomiting was present. There was no other symptom referable to the gastro-intestinal tract and none to the urinary tract. At the time she was admitted to the hospital, her pains had fairly well subsided and she was quite comfortable. Temperature was 99.6°, pulse 108, respiration 20.

The past history disclosed she had been vaccinated at the age of four years. Had tonsillitis with earache at the age of five and a few months following this attack her tonsils were removed. At the age of seven she had had otitis media, and at the age of eight had chickenpox. She never had any other illnesses. She also gave a history of having suffered previous generalized abdominal pains at various times, but nothing as severe as the present attack.

Physical examination revealed a well-developed, well-nourished, white girl, age nine, weighing about 70

pounds, lying very comfortably and at ease in bed. The head and scalp were negative. On inspection the eyes appeared normal and the pupils round, equal, reacting to light and accommodation. Ears were normal except for some slight amount of wax in the left auditory canal. Hearing appeared to be normal in both ears.

Fig. 1.

The nose and mouth were normal except for two carious teeth. The tonsils had been removed. The neck was negative. Breasts were normal in appearance and the chest normal in appearance. Lungs and heart sounds were normal. On inspection the abdomen was normal and only slightly generalized tenderness on deep palpation was present. There was no rigidity or spasticity of the abdominal muscles. No rebound tenderness was present. The psoas test was negative. A palpable mass about the size of an average orange could be made out in the lower right quadrant, this mass being movable and not tender. An x-ray examination of the chest revealed no pathology; x-ray of the abdomen disclosed gas in the stomach and bowel, most of which was in the large bowel. There was no evidence of gas in the region of the cecum or the ascending colon, due, perhaps, to soft tissue tumor displacing this portion of the bowel.

In view of the disappearance of pain and the subsidence of the acute attack, with the disappearance of tenderness, it was decided to continue further observation of the patient for twelve hours. At 10:15 a. m., re-examination revealed no tenderness whatsoever of the abdomen. The patient was entirely free of pain and the entire abdomen was soft so that a definite mass as previously outlined could now be easily palpated over the bladder region. At 1:30 p. m., re-examination again revealed a definite, firm, freely movable orange-size mass readily palpated in the lower right iliac region. Rectal examination revealed a mass in the right side of the pelvis with no tenderness.

Urine examination was entirely negative. A check on leukocytosis was 12,000, with 90 per cent p. m. n's.

At 7 p. m. the paient began to vomit and became listless. The abdomen was fairly soft and the same mass, now slightly tender, could again be palpated over the symphysis. It was then decided to operate.

Pre-operative diagnoses were: (1) appendicitis with omental adhesions; (2) intussusception of volvulus; (3) ovarian tumor.

Operation was performed that evening under general gas anesthesia. The abdomen was opened with a midline lower abdominal incision. Clear ascitic fluid was present. There were omental adhesions attached to the parietal peritoneum in the region of the symphysis pubis. A dusky-colored appearing mass, the size of a large orange, was present in the right side of the pelvis. This fairly firm growth was found to be an ovarian tumor with a twisted pedicle. This mass, including the tube and pedicle, was completely removed by clamping and ligating the pedicle. The left ovary was normal in size and appearance. The uterus was normal in size. There were no visible or palpable evidences of mestastases. The omentum had firmly united itself to the very tip of the appendix. The appendix was also removed.

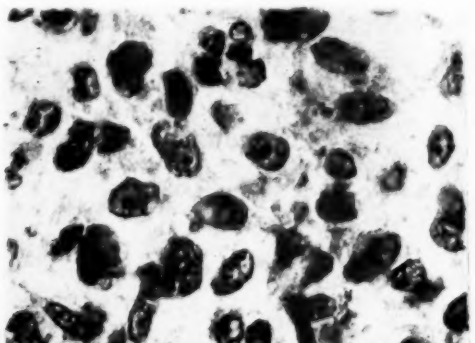

Fig. 2.

The patient made an uneventful recovery and is entirely well at this writing.

The *pathologist's report* is as follows:

"*Gross* appearance: The specimen consists of a smooth tumor mass, the size of a large orange, the surface of which has a bluish-grey color. The center of the tumor consists of a yellowish-grey solid tumor material and is covered by a thin membrane. The appendix is small, 4 cm. in length and 4 mm. in diameter.

"*Microscopic* description: The tumor is quite solid and cellular, being composed principally of fibroblasts, which produce, however, very few collagenous fibers. There is a moderate variation in size and shape of the cells, and mitotic figures are fairly frequently encountered. The tumor contains large numbers of vascular spaces within which occasionally may be seen free tumor cells. The appendix is without pathological changes.

"*Diagnosis*: Sarcoma of the ovary, moderate malignancy.

(Signed) Dr. Lufkin."

At this writing this patient is now twelve years of age, is well developed, weighs 118 pounds, and is 5 feet

(Continued on Page 554)

CLINICAL PATHOLOGIC SEMINAR*

Conducted by E. T. BELL, M.D.

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Chronic Glomerulonephritis

Case 17.—A man, aged twenty-four, was admitted to hospital January 27, at 2:10 a. m.; he had been entirely well until four weeks before admission when he developed a severe head cold. One week later he noted edema of the feet and ankles; some edema of the face and neck; no pain. Two days before admission, he developed a severe sore throat with a cough and a feeling of dryness in the throat. He had had three severe attacks of epistaxis in the past two days. He noticed some diminution in the amount of urine passed during the last few days. There was no pain at any time except that due to sore throat and cough. He had scarlet fever at the age of four; had mumps and measles; no disturbance of vision; no edema until the present illness. Father died of cardiac disease. Family history otherwise was unimportant.

Examination revealed a well developed, well nourished young white man, appearing acutely ill; very dyspneic; face slightly puffy; subconjunctival hemorrhages; pupils round, equal and reacted to light and accommodation; no apparent diminution of vision; nose normal; lips dry and fissured; tongue and posterior pharynx coated and a uremic odor was noted on the breath. There was marked inspiratory dyspnea but breath sounds were normal and resonance was normal throughout the chest. The apex beat of the heart was in the sixth interspace 1.5 cm. outside the nipple line; transverse measurement of the heart was 14 cm.; frequent ventricular extrasystoles. Systolic pressure was 164; diastolic varied from 0 to 40. Radial pulse was of fair quality; a loud first tone; systolic bruit at the apex.

Blood pressure in the receiving room was 188/90; it varied during the stay in hospital from this figure to 135/0. Liver edge was down 2 or 3 cm. but not tender. Extremities were covered with papulopustules and excoriations. Anus was surrounded by greenish, cheesy material. Prostate was thought to be enlarged. The patient was neurologic; reflexes were present but exaggeraated; there was no Babinski reaction.

Because of the marked stridor an examination of the larynx was done and diagnosis was made of papilloma; tracheotomy gave the patient very little relief. Venesection of 400 c.c. of blood was done.

Urine in the receiving room showed albumin ++++; 4 to 8 red blood cells per high power field; no white cells; a few cellular casts. Urine, after postmortem, showed alkaline reaction; specific gravity, 1.018; trace of albumin; no erythrocytes seen; occasional leukocytes: one or two casts.

The first blood chemistry showed 185 mg. of urea nitrogen; the following day it was 296 mg.; creatinin was 8.3 mg. At postmortem, urea nitrogen was 304.5 mg.; creatinin, 12.5 mg. Hemoglobin. 20 per cent; red cells, 1,420.000; white cells, 12,250; 96 per cent polymorphonuclear leukocytes, 4 per cent lymphocytes. He died, January 28.

Postmortem findings: There was slight puffiness beneath the eyes; otherwise no edema. The skin showed the lesions described above. The recent tracheotomy wound was noted. The subcutaneous fat was 1 cm. in thickness over the anterior abdominal wall. There was no excess of fluid in the peritoneal cavity, the pleural cavities or the pericardial cavity. The heart weighed 400 grams and showed no abnormality except hypertrophy of the left ventricle; there was no disease of the coronary arteries. The lungs showed no edema; no pneumonia. The liver weighed 1,635 grams; the parenchyma was slightly cloudy; there was no chronic passive congestion; the gallbladder and ducts were normal. The spleen weiged 200 grams and showed no disease. The pancreas and adrenals were normal.

The right kidney weighed 40 grams, the left 47 grams. There was marked hydronephrosis and hydroureter on both sides with extreme atrophy of the renal cortices; the ureters were not obstructed. The bladder showed no disease. There was no obstruction of the urethra. The larynx and trachea showed no changes except a mucous exudate, probably developing subsequent to the tracheotomy; there was no edema of the glottis.

Microscopic examination of the kidneys showed typical chronic glomerulonephritis; the atrophy was due to the destruction of the glomeruli and not to hydronephrosis.

Comment.—The hydronephrosis in this case is unexplained; it is not due to obstruction. The atrophy of the kidneys is not due to hydronephrosis but to the glomerular disease. The clinical picture is that of chronic glomerulonephritis; this is indicated by the hypertension and renal insufficiency. In advanced chronic glomerulonephritis with small kidneys, edema is often not conspicuous and may be absent. Evidently the disease had been present many years although the onset of symptoms was quite recent. There is no history of an acute attack, but the majority of cases of chronic glomerulonephritis give no history of typical acute nephritis.

Pyelonephritis

Case 18.—A man, aged sixty-nine, was admitted to hospital, February 15. He was first seen in the genitourinary outpatient department, on January 18, when he complained of frequency, urgency and foul urine. He had felt quite well until September of the previous year, at which time he noticed blood in the urine and began to have frequency. There was some pain in the region of the bladder; no other pains, no chills or fever. The symptoms gradually increased so that on admission, February 15, he passed urine ten times during the night and every ten to fifteen minutes during the day. The urine was dark red in color and foul.

Examination. He was undernourished. The chest appeared clear. Blood pressure, 132/80. The heart was enlarged to the left; apex beat visible just outside the nipple line; marked diastolic murmur best heard over the apex and in the third and fourth left interspaces. On February 18, cystoscopy showed a considerable mass of encrusted material on the mucosa of the bladder; the raw surfaces were much inflamed.

Blood on admission, 60 per cent hemoglobin; 3,580,000 red cells; 11,750 white cells. Blood chemistry, 1.8 mm. of creatinin; 24.5 mg. urea nitrogen. Urine: 1.010 to 1.017; constant heavy trace of albumin; few to many white blood cells; few to many red blood cells.

Intravenous pyelogram, March 6: faint appearance of dye on the five-minute film, in the right kidney; not seen until the fifteen-minute film in the left kidney, suggesting delayed function on the left side. Films up to the ninety-minute period showed renal pelves only

fairly well, suggesting rather slow function of both kidneys, evidently more marked on the left; marked dilation of the calices of the left kidney; moderate dilation on the right, indicating bilateral hydronephrosis; marked angulation of the upper portion of the right ureter and redundancy at the inlet of the pelvis; generalized dilation of this ureter. The left ureter was not satisfactorily visualized. There was marked arthritis of the lumbar spine.

The temperature, at first, ranged from 98° to 102.8°; then it leveled out save for occasional rises to 99° and 100°. On March 10, he developed a sudden, severe precordial pain. The pulse became feeble and the face cyanotic. He gradually grew worse and died at 12:40 a. m., March 11.

Postmortem report: The body was moderately emaciated; showed no edema or jaundice. There was no peritonitis. The heart weighed 400 grams and was practically normal except for some hypertrophy of the left ventricle. The lungs showed extensive diffuse bronchopneumonia. Both renal pelves and ureters were moderately distended and contained purulent exudate. Numerous small abscesses were found throughout the kidneys. A rather marked cystitis was present. The prostate was enlarged and almost completely replaced by an abscess. No important changes were noted in other organs.

Diagnosis: Bilateral pyelonephritis with a prostatic abscess.

Comment.—The clinical studies established the presence of bilateral pyelonephritis. It is probable that the infection originated in the kidneys and extended downward to the bladder and prostate. Such descending infections result in moderate hydronephrosis because of obstruction of the ureters from inflammatory exudate. It is, however, possible that the initial trouble was an abscess of the prostate and that the infection in the kidneys was of ascending type.

Compression Myelitis of the Cord

Case 19.—A man, sixty years old, was admitted, February 6, with a history of increasing weakness and numbness of the legs and over the lower abdomen for the previous four months. He had quivering sensations in his legs at times. He was able to walk with difficulty; had no incontinence. For a month previous to admission he had had pain in the left flank when bending over. His past history gave no important data.

Examination revealed hyperesthesia at the level of the ninth thoracic which covered two segments; below this he had reduced tactile sensation, weakness of the muscles and increased knee jerks. While in the hospital he developed acute bronchitis and was allowed to go home, February 17, to recover.

He returned March 31; weakness of the legs and other symptoms had increased; it was now necessary for him to use crutches. Lipiodol was put into the cisterna and x-ray showed that the iodin had stopped at the level of the seventh and eighth thoracic spines. Operation was performed, March 23; a meningeal tumor, 1.5 cm. in diameter, was removed; this was attached at the inner surface of the dura. The operation was under general anesthesia and without incident. The temperature, after operation, rose to 100.8°; on March 24, it was 102.4°; by the 25th it was 107.6°. The patient was transfused with 500 c.c. of blood on the 25th. The blood pressure at noon, on the 25th, was 112/76 and dropped to 90/40 by evening. The patient died at 4:45 a. m., March 26.

Just before death, twitching of the face muscles developed. He could not swallow for twelve hours before death.

Postmortem examination: The gallbladder contained several calculi and its walls were thickened. Otherwise there were no lesions in the thoracic or abdominal viscera. There was no disease of the brain. The spinal cord, at the site of the operation, showed very slight gross changes but on microscopic examination there was a severe myelitis of degenerative type, involving both the gray and the white matter at the point where the tumor was pressing upon the cord.

Diagnosis: Compression myelitis of the cord.

Comment.—This is a benign meningioma but it had produced severe damage of the spinal cord before it was removed. The clinical record shows how the tumor was localized both by clinical examination and by the introduction of lipiodol.

Carcinoma of the Duodenum

Case 20.—A man, sixty-three years old, was admitted, February 13, complaining of weakness, loss of weight and jaundice. The onset of his illness was in January (a month before) when he developed diarrhea with eight bowel movements daily, accompanied by colicky pains in the abdomen. The diarrhea lasted ten days and then gradually disappeared. The abdominal pain and soreness also disappeared. The stools, however, became clay colored and jaundice appeared. His appetite became poor and he gradually lost weight and strength.

On admission, February 13, he was somewhat emaciated and severely jaundiced. The loss of weight was 63 pounds (from 165 pounds to 102 pounds). Chest and abdomen showed no abnormality upon physical examination. The liver was hard and a greatly distended gallbladder was palpable.

Blood: hemoglobin, 77 per cent; 7,300 leukocytes. Jaundice was severe; icterus index, 111 units. Urine contained a large amount of bilirubin; no urobilinogen. The feces were clay-colored. Quantitative urobilinogen on the feces was "negative to a faint trace."

Exploratory operation was performed February 26. The gall bladder contained 350 c.c. of green bile. It was anastomosed with the stomach. Following the operation there was no improvement. The patient gradually became weaker. The jaundice remained intense. Urine and feces remained the same as they were prior to the operation. The patient died, March 19.

Postmortem report: Rather marked emaciation; severe jaundice; cholecystogastrostomy was noted; this was firmly fixed but there was a purulent exudate around it; there was no general peritonitis. There was carcinoma arising in the descending portion of the duodenum which had spread extensively over this portion and had infiltrated the head of the pancreas. The common bile duct was completely occluded in its terminal portion by pressure of the tumor. The pancreatic duct, throughout the gland, was markedly distended as a result of occlusion of the duct of Wirsung. All of the viscera were deeply bile-stained. There were no metastases in distant organs but there was extensive infiltration into the head of the pancreas. The liver showed marked central atrophy of the cords, due to obstruction of the common duct. The obstruction of the common duct was complete as indicated by the absence of urobilinigen in the feces and urine. The clinical diagnosis of carcinoma of the pancreas was justified because in the large majority of instances a tumor developing in this region arises from the pancreas rather than the duodenum.

EDITORIAL

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BUSINESS MANAGER
J. R. BRUCE, Saint Paul

Volume 19 — AUGUST, 1936 — Number 8

Inter-State Post Graduate Assembly

AN opportunity will again be given Minnesota physicians to attend the meeting of the Inter-State Post Graduate Assembly when it convenes in Saint Paul the week of October 12, 1936. This annual meeting is essentially a short post-graduate course. Those who address the meeting are almost entirely professors in medical schools in this country and Canada. Generally, a few internationally known professors add their contributions to the meetings. In this issue of MINNESOTA MEDICINE appear in an advertisement the names of those who will participate in the program, and in our September number will be published the program of the meeting. A perusal of the names of those participating and the subjects to be presented should be convincing.

After all, the rank and file of the profession have little opportunity to take post-graduate work. To abandon one's practice for a trip East or abroad requires considerable sacrifice of time and money. However desirable a trip abroad may be, the science of medicine in our own country is hard to excel. An incredible amount of information is crowded into a week's time at these Inter-State Assemblies. The variety of subjects enables one to pick and choose, although authoritative opinions on subjects outside a physician's particular field are broadening and educational.

Information regarding the Assembly is being disseminated and emphasized in advance so that our readers may make their plans to take advantage of this opportunity which will be at their very doorsteps.

State Meeting

PLANS for the Eighty-fourth Annual Meeting of the Minnesota State Medical Association are going forward rapidly.

The meeting is to be held in the St. Paul Auditorium in the Arena, Stem Hall, and the new Auditorium theater, and bids fair to be more important and extensive, so far as scientific program and exhibits are concerned, than any previous gathering.

Thirty-three technical exhibitors have already reserved space in the exhibit section and, in that connection, the following letter from a representative of one such exhibitor, Ayerst McKenna and Harrison (United States) Ltd. of New York, is an interesting testimonial of the esteem in which many technical exhibitors, hold the Minnesota meeting:

"We shall be pleased to have a plan of the Convention Hall (in St. Paul) as soon as it is available in order that we may select a site.

"Since, in your letter, you invite criticism of the Rochester meeting, here goes! In company with our local representative I attended the convention and must confess that I was agreeably surprised. Never before in my wide experience of such conventions have I attended one so successful from the point of view of interest on the part of doctors attending and in the numbers. Perhaps the venue had a lot to do with the success of the meeting but, apart from that, the interest displayed by so many doctors was a revelation to me . . ."

Danger of Intravenous Calcium

IN view of the popularity of intravenous calcium therapy a warning has been given of the grave danger that apparently lies in administration of calcium salts intravenously to patients who have previously received digitalis preparations.

Bower and Mengle* have recently reported two cases in which sudden death, apparently of cardiac origin, followed intravenous calcium given to patients who had been receiving digitalis medication.

This is not the first warning issued on the subject. In 1931 Liebermann reported the digitalis-like action of calcium on the heart and in 1933 published the results of experiments with scillaren (which has a digitalis-like action on the heart) and calcium. He pointed out the danger of using the two drugs together as their similar actions have what is termed an additive effect.

Bower and Mengle found that if 15 per cent of the lethal dose of calcium was given an animal there was slight change in the heart action. If digalen was first given and then the same dose of calcium, the animal's heart showed irregular action with fibrillation and asystole. If digalen was first given and then 30 to 40 per cent of the lethal dose of calcium, sudden death resulted. On the other hand, if 30 per cent of the lethal dose of calcium was given first and then large doses of digalen, no such untoward results followed.

The danger then lies in giving calcium intravenously after digitalis has been administered. Inasmuch as no warning has been given by any of the pharmaceutical houses of any contradictions to the use of calcium intravenously, the apparent danger in this method of medication should be called to the attention of the profession.

Medical Library Association

At the national convention of the Medical Library Association held in Saint Paul in June, the following officers were elected: Dr. W. W. Francis of Montreal, Canada, president; James F. Ballard, Boston, vice president; Janet Doe, New York City, secretary, and Mary Louis Marshall, New Orleans, treasurer. Richmond, Va., was chosen as the 1937 convention city.

*Bower, J. O., and Mengle, H. A. K.: Additive effect of calcium and digitalis. Jour. Am. Med. Assn., 106:1151 (Apr. 4, 1936).

In Memoriam

Henry Theodore Nippert*
1868-1936

DR. Henry Theodore Nippert was born in Heilbron, Wuerttenberg, Germany, February 12, 1868, the son of the Reverend Dr. Louis Nippert and Adeleid (nee Lindemann) Nippert. Father was then an American citizen, who had been sent by his church to supervise and promote Methodism in Germany and Switzerland. This he did with success for thirty-six years, during which time he retained his American citizenship. He raised a large family. It was the distinction and the pride of his children to be born abroad as American citizens. Shortly after my birth, father was appointed to take charge as director, of the newly established seminary, in Frankfort-on-Main. Here I attended school and high school, graduating at the age of seventeen years. Then I entered the drug trade. In September, 1886, father made up his mind to return to the United States. He took charge of church work, first in Pittsburgh, Pa., and later in Cincinnati, Ohio, while I made straight for Minneapolis, Minnesota, where my older brother, Doctor Louis Nippert, had started to practice medicine a few years before. The first job I had was as a clerk in a drug store owned by Mr. August Grotefend, Northeast Marshall Avenue, where I remained about one and one-half years. Then I left for Cincinnati, Ohio, and entered the Cincinnati College of Pharmacy, for which I graduated two years later with the degree of Ph.G. Shortly after graduation, I took up the study of medicine at the Miami Medical College, a department of the University of Cincinnati, from which I graduated in the year 1891. I then entered the Cincinnati General Hospital, first as externe and then as interne.

On August 2, 1893, I was married to Bertha Elizabeth Wendt, of Newport, Kentucky, and started the practice of medicine in Saint Paul. During the first year, I joined the Ramsey County Medical Society, later the State Medical Society and the American Medical Association; and was elected to the Minnesota Academy of Medicine. I had the honor and the privilege to serve the Ramsey County Medical Society as their president in the year 1916. I served on the Staff of the Ancker Hospital for about twenty-five years, resigning in favor of younger members of the profession, in 1919. While a member of the Medical Staff, I was instructor of medicine to the students of Hamline University Medical Department, and later the University of Minnesota.

I hope and express the wish that my professional brethren and comrades in arms will always be as con-

*Written by Dr. Nippert shortly before his death, which occurred July 4, 1936, at his summer home on Big Sand Lake, Minnesota. Dr. Nippert is survived by his widow; three daughters—Mrs. Vernon D. E. Smith and Mrs. John B. McGrath, Saint Paul, and Mrs. Arnulf Ueland, Minneapolis; a son—Carl L. Nippert, Saint Paul; two brothers—Dr. Edward Nippert, Los Angeles, and Judge Alfred K. Nippert, Cincinnati; and three sisters—Mrs. Louis Hemlinge, Seattle, and the Misses Eleanore and Mary Nippert, Cincinnati.

genial and considerate to and of each other, as it has been my privilege to find and be treated by them, during my years of association with them.

During my practice in this city of ours, which has grown dear to me, as well as our wonderful State of Minnesota, I have always endeavored, and if I have succeeded, I consider that I have reached the goal of my earthly efforts:

First: To do my duty and to take care of my family.

Second: To do the best I know of to care for my patients, and To do my duty to my country, state and our city.

Last, but not least: To stand heart and soul by my chosen profession, and my comrades; to help to develop a feeling of friendship, tolerance and regard for each other and to sustain each other in our hour of trial and trouble, which so frequently occurs in the practice of medicine.

So "Nip" calls to you: "God Bless you and be with you, until we meet again at the pond which we all have to cross and from which no traveler returns."

I heartily agree with William Allen White, who said: "As one grows into one's middle sixties, death seems more reasonable than it does in childhood and youth. The thought of death used to terrify me. Now it seems a natural thing, a part of life, just another experience, whatever it is. So many of my friends have faced it, why not I? I have been shaving this funny old face every day, including Sunday, for years and years. I have come to look on it as a mask, behind which lies the reality that it has to hide. It is getting a bit battered and shop worn. Perhaps it would not be such a bad idea to cast it off and let dust return to dust."

As our friend who never disappoints us in calling us sooner or later, Death may be near by, as expressed in the following:

Zeight sich der Tod einst mit Verlaub und ruft mich: Bruder, komm'! Dann stelle ich mich am Anfang taub und schaue mich nicht um. Doch sagt der liebe Nippy: Komm', mache keine Umstände; dann lege ich mein Stethoscope hin und sage der Welt, Adieu.

HENRY THEODORE NIPPERT.

Monroe M. Ghent
1870-1936

MONROE M. Ghent, known as "Mun" by his family and intimate friends from early boyhood, was the eldest son of Washington and Fronia (Counsel) Ghent. He was born April 10, 1870, in Williams County, near Marion, Illinois, and his death occurred in his home at 10:30 P. M. May 10, 1936. As he had often wished, he died suddenly, from an attack of angina pectoris which came on earlier in the evening as he was driving home after a game of tennis.

Dr. Ghent attended grade and high school at Marion, Illinois, and later graduated from Valparaiso College, where he chummed with Dr. Thomas W. Stumm of Saint Paul, who passed away in 1914 from cardiac failure while studying in Vienna.

Dr. Ghent taught school in Williams County, Illinois, until he entered Rush Medical College at Chicago, from which he graduated in 1901. He first located at Hibbing on the Iron Range but after a short time he left for three years of postgraduate work in Vienna and other European cities. Because Dr. Stumm was here he came to Saint Paul in 1906 and located on Dayton's Bluff, where he continued in active practice till the day of his death.

Dr. Ghent was a member of Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association. He was a staff member at Mounds Park, Bethesda and St. Johns Hospitals in Saint Paul, where he was always keenly interested in the work of the Hospitals and the work of the other members of the staff. He was a most faithful attendant at all staff meetings and could be depended upon to make the discussions interesting and instructive, was quick to comment and criticize and never hesitated to bring out what he thought was right and true even though he himself was hurt by it. He was often sarcastic and sometimes quite intolerant of the opinions of others in discussion of cases. This attitude was probably to a certain degree assumed, as he often said that the best way to get anything worth while out of a discussion was to put the speakers on the defensive and get some of them mad, at him or at each other. He had supreme contempt for what he considered racketeering in medicine and a sincere reverence for those whom he considered great and honest in the medical profession.

He was a tireless student and for the past nine or ten years he rarely missed Dr. Bell's pathologic conferences at the University of Minnesota and he attended most of the Staff meetings of the University Hospital. He was a frequent visitor at the Mayo Clinic hospital and staff meetings and attended most of the meetings of the Interstate Medical Assembly and continually urged younger men to attend with him.

Dr. Ghent was probably one of the most generous of all Saint Paul's doctors in the help and inspiration he so willingly gave to younger men. He was never so happy as when he could be of assistance either with advice or actual help to younger surgeons in interesting or complicated cases and his interest did not depend on what he would ever get out of it.

In 1905 he married Rosa Welser. Mrs. Ghent died in 1917.

In 1920 he married Mrs. Bertha Owen Morris, who survives him. He is also survived by a brother, Walter C. Ghent of Carterville, Illinois.

Monroe Ghent was an outstanding character and will not soon be forgotten by his many riends. He was a great lover of sports—tennis, golf, and horseback riding in the summer and bowling and ping-pong for winter exercise. He loved his fellowmen and was devoted to what was right and fair. He had a happy and a practical philosophy of life, he loved a good story, he was kind and generous, and was loved by his patients. His genial companionship and loyal devotion to his friends endeared him to all.

EDWARD W. OSTERGREN
A. S. ARNQUIST
JOHN A. SWANSON.

E. Starr Judd*

WHEN I came to Rochester in the summer of 1906 I found Starr Judd working as Dr. C. H. Mayo's first assistant in the operating room and taking care of the patients who had been discharged from the hospital. As an extern for the first two months of my stay, I came in intimate contact with him in this daily work. When I was appointed an intern, I was assigned to the position of second assistant in Dr. Charlie's operating room and worked every day with Starr. We spent our evenings and Sundays together, often driving by team on Sunday to Oronoco, for there were but two or three automobiles in Rochester at that time. Later, it was my good fortune to take an annual hunting trip to northern Minnesota in the fall and live in camp for several weeks with him and with Henry Plummer.

When Starr was given an operating room I was his first assistant, a position I held until I left the Clinic in the fall of 1909. I mention all this to show how closely I was associated with him daily in his early work for a period of three and one-half years and I was honored to have been one of his earliest and best friends.

The traits which he showed in those early days and which deeply impressed me were his industry, his ability to solve problems for himself, his faithful performance of his duty, his kindness and his gentleness to his patients, his dexterity in the operating room, his conservatism in the treatment of unusual surgical problems, his great modesty and his quiet dignity, and, with all this, the companionship and the loyalty which he showed his early friends.

When I left the Clinic I followed his career with the keenest interest and I saw him rise to international fame and receive every honor which could be bestowed on an American surgeon, for he held membership in the best and most select surgical societies. He was elected president of the American Medical Association, one of the great medical honors to come to any man, and the best minds in medicine were counted as his friends. His many contributions to surgery were original and the result of thoughtful and conservative work. In all his writings he showed that same modest demeanor which characterized his life and his work. Naturally I saw much of him after I left, for I returned to Rochester as often as I was able and I met him frequently at the various medical meetings. What impressed me, as the years rolled by and his fame spread throughout the medical world, was that he had not changed a whit, for he was the same sweet modest loyal Starr that we knew and loved in the old days. How few men could have stood the burden of great fame and recognition as gracefully and as modestly as he.

Starr inspired a complete and an absolute confidence in his patients when he first met them, for he was a skilled psychologist as well as a great surgeon. Perhaps one of the best tributes to his surgical skill and to his personality was the confidence he inspired among the surgeons of the land, for he was considered the surgeons' surgeon and they flocked to him when operations were needed to be performed upon themselves or upon their families. I speak with great feeling for he was my surgeon!

Starr Judd embodied all the characteristics of a truly great man. He was a master surgeon who contributed much to the advancement of modern medicine; he was a devoted husband and father whose home life was ideal; he had the modesty and sweetness that is so unusual to find retained after great success and world renown have come; he was a true friend and a lovable companion. His unfortunate and untimely death is a tragic loss to American medicine, to the Clinic, to this Society and to his countless patients and friends.

He will live on to serve as an inspiration and a sweet tender memory in the minds of all of us who knew him and who loved him to much.

*Tribute to E. Starr Judd presented by Donald Guthrie, M.D., Sayre, Pennsylvania, at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, June 4, 1936.

Louise Marie Gerber-Dietmeier

1868-1936

DR. Louise Marie Gerber-Dietmeier of Jasper, Minnesota, died after several years of impaired health from pneumonia July 2, 1936.

Louise Marie Gerber-Dietmeier was born in Monroe, Green County, Wisconsin, November 23, 1868, the daughter of John and Magdeline Gerber, natives of Switzerland. After graduating from high school at Kasson, she taught in the public schools. She then studied medicine and received her medical degree in 1893, following which she practiced in Ada for about seven years. In 1895-1896 she took postgraduate work at the Polyclinic in New York and while there supplemented her medical work with voice culture which enabled her to become a good speaker and vocalist.

In 1898 Dr. Gerber travelled in the Orient, visiting the leper colony in the Hawaiian Islands. Later she was to use the experience gained on this trip in diagnosing a case of leprosy at Jasper where she located in 1898. In 1910 she visited European clinics and upon her return built an artistic and modern hospital at Jasper.

On June 2, 1919, Dr. Gerber was married to Dr. Lewis Dietmeier in the Episcopal church at Freeport, Illinois. She is survived by her husband and five stepchildren—Dwight of Jasper, Roland of Helena, Montana, Elroy of Minneapolis, Lowell of Superior, Wisconsin, and Evangeline of Minneapolis. Three brothers, Anid Gerber of Spokane, Will Gerber of Pine Island, Sam Gerber of Argyle, and a sister, Mrs. C. S. Calkins, of Eugene, Oregon, also survive her.

Dr. Gerber-Dietmeier was unusually active in the practice of her profession until a few years ago. Five weeks before her death she was taken to the University Hospital suffering from a mental affliction and thence to the hospital at St. Peter, where death came.

MEDICAL ECONOMICS

Your Standing Orders

1. Keep in touch with your local county welfare boards so that proper arrangements can be made in your community for care of the sick poor: Also for the medical hospital and nursing care allowed in the law for recipients of old age pensions.

2. Make the acquaintance of your Senator and Representatives so as to keep them informed of the medical viewpoint toward all current problems involving medical care.

The above is a condensed version of the Standing Orders printed last month at the head of these columns.

They are so important to the future of medicine in Minnesota that they will bear reprinting. They should take first place on the program of every county society this year.

Under Fire Again

A writer of the so-called "liberal press" by the name of James Rorty has recently entered the lists against the policies of Organized Medicine in general and against the leadership of Dr. Morris Fishbein in particular.

The contentions and the sentiments expressed by Mr. Rorty are familiar. They have been voiced often before, but chiefly, in the publications of the "lunatic fringe" of healing—and in the publications of the rascally fringe with nostrums to sell.

This is, perhaps, the first determined onslaught in the radical intellectual weeklies. It was to be expected, of course, and it is particularly interesting because even here, in an editorial atmosphere where the dialectic is usually subtler, the Rorty attack is not subtle.

Issue Disregarded

It is characterized, instead, by a childlike acceptance of oft-recited and oft-refuted statistics; also by a childish disregard for the deeper issues at stake in the question of whether sickness insurance and paternalistic medical care shall be instituted in the United States.

It is hardly worthwhile here to refute the old figures again but there is one aspect of the statistical onslaught which should be kept in mind always by the physicians. It is this: that the reports of the Committee on Costs of Medical Care, which serve as powder and shot for all these attacks, are based upon a definition of illness that uses economic standards only, as a basis for computation. Amounts of medical care given or withheld are measured solely by charges made. Nowhere is there any effort to show how many sick persons sought care and were denied. Any evaluation of the amount of medical care available or lacking is worthless without consideration of this factor and of the great volume, also, of unrecorded service.

In any case, after all the statistics are cited and all the attacks upon the integrity of Doctor Fishbein have been brought to a resounding period, the real issue remains to be stated and answered.

The real issue in this question of medical care, as in all other relations of public and private life in America today, is: Are we Americans to follow Europe into a system of paternalism in which—in theory, at least—all the emergencies and uncertainties of a man's life are cared for by an autocratic power? Or are we to retain our essentially American philosophy of life and government in which the least possible government control is regarded as the best; in which the individual is free to solve his own problems and direct his own life?

Government Care Unsatisfactory

In the end, the American way is calculated to produce a people that has learned to solve its own problems. The ultimate end of the paternalistic system even under its most ideal conditions, is the production of a race of dependents, under-developed, incapable of intelligent control of its own destinies.

In addition, the doctors know from the experience of their European colleagues that medical care under fascism is most unsatisfactory. Politics, greed and inefficiency stand between the people and the efficient working of government medical care.

This is reason enough; but it is a question, in general, that goes deeper than Mr. Rorty has assumed.

Medicine Cannot Quibble

It is a vital part of the great issue that Americans have before them on all fronts. Medicine cannot quibble with it, nor espouse a false liberalism, simply to save itself from the onslaught of professional humanitarians.

As to specific charges of boycott, politics, demagogism made by Mr. Rorty in the two articles that appeared recently *(Forum,* July, 1936, "Medicine's Horse and Buggy" and *The Nation,* June 24, 1936, "The Case of John Kingsbury") they nicely exemplify the kind of political mud-slinging that medicine must look for now, from time to time, and there is small use in refuting them.

Thanks to Doctor Fishbein

America, says Mr. Rorty with a kind of horror, is almost the only civilized nation in the world that has failed to provide, by government organization or subsidy, for medical care for all the people. And he says that this failure is largely due to the American Medical Association and Dr. Fishbein. If that is true, then the fault must be laid at the doors, also, of the more than 90,000 physicians of the United States whom the American Medical Association represents. And why should the American Medical Association oppose medical care thus provided for all the people? Is it because the doctors of America like to stand back in their luxurious offices and hospitals and see helpless people suffer? Is it because these men would really enjoy withholding medical care from the people? Is it because they are medical Capone's revelling in ill-gotten gains and protecting them by dirty politics against the possibility of a more humane system?

No normal child of ten could be made to believe such a thing.

Illness Not Checked

The answer, of course, is this: The doctors of America see that the theory of social medicine fails when it is put to the test. They see the progress of medicine hampered and halted; they see, too, that illness is not checked and death rates are not cut down.

On the other hand, they see America, the only civilized nation that has not embraced some form of social or insurance medicine, steadily conquering its disease enemies, cutting down its death rates, checking its morbidity in spite of this alleged backwardness.

Not Strong Enough

If, as Mr. Rorty earnestly urges, Dr. Fishbein and the political heads of the American Medical Association are exercising a stranglehold on American public opinion the physicians of America are certainly to be congratulated. What the other organizations—the American Legion, the Federation of Labor, for instance, would not give for such a stranglehold!

The truth is otherwise, of course. In spite of the fact that fully ninety per cent of them are in sympathy with the policies of the American Medical Association, American physicians, even with Doctor Fishbein as their spokesman, are not so powerful by one-half as they must be, if they are to be sure of protecting American medicine from the reforms that are so uncritically urged by Mr. Rorty.

California Swings to the Right

The following excerpts from an editorial recently published by *California and Western Medicine* are particularly interesting to medical observers in other parts of the country. They represent an important change of attitude on the part of one of the few units of organized medicine ever to dally with proposals for sickness insurance in the United States. Incidentally, they rob Mr. Rorty (mentioned above in these

columns) of the only real evidence he was able to marshal to his aid for the utterly unwarranted contention that officers of the American Medical Association do not represent the rank and file of doctors in the United States.

"Change of Front"

"If one outstanding feature of the attitude of the Coronado House of Delegates on matters of major policy deserves mentioning, it would be this: that evidently a somewhat radical change of front concerning health insurance is quite apparent in the California Medical Association as compared with points of view to which strenuous expression was given at Riverside in 1934, at the memorable special session in Los Angeles in 1935 and at the later regular session in the same year at Yosemite. . . . The delegated representatives of the profession, in meetings of the House of Delegates at Coronado, gave expression to their interest in methods of medical practice through resolutions submitted. But, basing judgment on the votes they gave, there can be little doubt on how a goodly majority of the delegates stood respecting matters of further experimentation with expensive, unsatisfactory surveys which thus far have led to little more than a startling dissipation of resources which the Association had slowly accumulated in previous years.

Undesirable Remedies

*"The conversations among delegates and attending members gave evidence, too, of the general thought now held by members of the profession that, while there has been a tremendous agitation on paper and in the minds of a small number of the laity and physicians concerning the amount and kind of medical and hospital care needed by a limited portion of citizens belonging to the lower income bracket groups, the propaganda so carried on by some of the proponents of certain health insurance plans had gone to extremes; and that the remedies were not adapted to achieving desirable ends for either the lay public or the medical profession.** The Coronado delegates gave no indication of desire to pursue, at the expense of the Association's members, further will o' the wisp or other surveys which, if really needed, might well be carried out through federal, state or local public agencies rather than at the expense of our physicians through their constituted organizations. . . .

Little to Show

"Now that so much has been spent and there is so little to show for it, the realization of what is construed as hasty and ill-advised action becomes more and more apparent. Unfortunately this change of mind does not bring back into the Association's treasury, the thousands of dollars expended upon the adventure."

(*Italics are ours.—THE EDITORS.)

President's Message

THE difficult problems involved in the maintenance of membership in our organization received much-needed attention in the action of the House of Delegates at Kansas City.

The vast majority of medical men are jealous of the high honor of their profession and feel personally affronted when their own high ethics are violated by men who have been accepted into membership in the units of organized medicine anywhere in the United States.

The difficulty and unpleasantness involved in disciplining such members locally has, too often, permitted undesirables to retain membership indefinitely.

At the suggestion of the Judicial Council a new machinery has now been set up under the American Medical Association by which such situation can be handled where the local society cannot or will not act. By an amendment to the by-laws of the Association, the Judicial Council "shall have power to request the President to appoint investigating juries to which it may refer complaints or evidence of unethical conduct which in its judgment are of greater than local concern. Such investigating juries, if probable cause for action shall be shown, shall report with formal charges to the President, who shall appoint a prosecutor who, in the name of and in behalf of the American Medical Association, shall prosecute charges against the accused before the Council. The Council shall have the power to acquit, admonish, suspend or expel the accused."

The strength and influence of organized medicine will depend, in the end, upon the quality of its membership. Unlike any other organization in American life, medical organization must show an individual membership that is above reproach.

It is to be hoped that this new amendment will be used forcefully and effectively to keep the fences tight and the standards high.

W. W. WILL, President,

Minnesota State Medical Association.

The Writing on the Wall

Needy old people in Minnesota have now been granted their pensions and their right to receive medical, hospital and nursing care from some established source has been specified in the law.

Does that, then, dispose of the problem of the needy aged?

It does not, in the opinion of Mr. Carl Hibbard, Fort Snelling, regional director for the Veterans' Administration, who spoke at a recent hospital meeting in St. Paul.

Mr. Hibbard professed to see, in the history of pension legislation and hospital benefits for veterans, an example of what may be expected to follow in due course upon the initial pension legislation for the aged.

First, he says, there is a modest bounty granted by the government. This bounty is not large enough to provide for extraordinary and occasional expenditures such as medical services.

At the same time, these services are not likely to be supplied freely, he believes, by all the responsible county authorities. Therefore, an organization composed of old age pension groups and, more important still, of sons and daughters of the pensioners, can be confidently expected to appear. The first objective is likely to be the establishment of special medical services and hospitalization without cost.

Liberalizing Pensions

The fact is, of course, that pension laws are nearly always liberalized and seldom successfully cut.

It is a fact, also, that a few county organizations have already made some difficulty about providing medical and hospital care for pensioners.

Will these difficulties prompt pension recipients and their families to demand special facilities for medical care for the needy aged?

Mr. Hibbard thinks so. He sees a parallel between pension legislation for the aged and pension legislation for the veterans and he believes that here, too, the writing is on the wall.

Obviously there is no need for government medical facilities for the care of the aged.

There is a need, however, for immediate negotiation on the part of medical representatives in each community with local county relief authorities to see that aged pensioners are not denied the care that is allowed them in addition to their pensions in the law.

Co-ordinating Division

The first tangible result of the discussions and resolutions by relief workers, mayors and other functionaries who met in St. Paul last spring is the new Division of Coördinated Field Service just organized under the State Board of Control.

This division is headed by Mr. Benjamin E. Youngdahl, former Director of Social Service for the now discontinued SERA.

It will represent the Children's Bureau of the State Board of Control and all other social welfare agencies that are under the direct supervision of the Board.

It will also handle all field work pertaining to direct relief, old age pensions, and also give assistance to any other state or federal agencies that may apply; for example, the WPA, the Rural Resettlement Administration, the War Veterans' Relief Agency.

To Promote Efficiency

This assistance will consist, depending upon the needs of the individual agency, in helping to provide a qualified personnel; in checking as to the adequacy of the staff or the case work procedure; in investigations relating to the sufficiency of financial grants and in proper coördination of all services to avoid waste and duplication.

"Effort will be made," according to an official statement issued by the new division, "to unify and integrate various related welfare programs and activities in the counties with the dual purpose of promoting efficiency and furthering economy . . ."

Legislation has not yet been passed, of course, providing for any official consolidation of the work of all of these agencies. Many of the desired reforms and improvements can be put into effect without legislation, it is believed, through the good offices of this division.

Will Cooperate With Doctors

Incidentally, the new division has signified a desire to work closely with the medical profession in all respects. It is part of the organization's program to lend its influence toward the

establishment of medical care for the indigent and for recipients of old age assistance upon a basis of free choice of physician, with the physician paid for the work on a fee basis.

It is a happy augury for the future that, after an experience of several years with the conduct of relief generally, former SERA officials who are now acting in an advisory capacity to the new county system are all unanimous in favor of free choice of physicians for all patients and of the participation upon a fee basis of all doctors in the community for care of the sick poor.

This conviction is not the result of any pressure on the part of the medical profession but of years of actual experience backed by a careful study of costs under SERA.

Do You Care?

(A monthly editorial contributed by the Medico-Legal Advisory Committee)

The practice of medicine in this year, 1936, has become a complicated one. Thirty years ago the medical man's life, especially in the urban community, was an individualistic one. He was beholden to himself alone. He, in his practice, lived an independent life in which he was numbered among the few educated members of the local social order. He was revered by young and old alike. To all he was "Our Doctor." Today this is changed. Individualism has given way to dependence on others in his work. Hospitals, assistants, nurses and associates, clinics and other more loose associations have complicated the picture. He now has become just "a doctor" of the community.

Each addition to his armamentarium has complicated his duty to society and the fellow members of his profession. Is it to be wondered at that many men are overwhelmed by the intricacy of practice and assume a "Don't Care" attitude toward the members of their own vocation? If Service Clubs and other business men's associations have their place in our lives, if they lead to a fuller interest in community life and an acquaintance with the problems of other professions and businesses, then your Medico-Legal Advisory Committee asks each member of our State society, likewise, to consecrate a little time each day to thoughts of medicine's welfare, to going to medical meetings, to assisting the officers of each county society in the furtherance of their duties, to the bettering of programs and clinics, and especially to getting better acquainted with each other. Animosities will then be forgotten in the light of new-found interests in each others' problems. Conversation across the festive board will dispel prejudices, and a closer association will make for lasting friendship.

A Utopia, maybe, but an ideal to be sought for.

New Life

Medical societies are no longer the formal, cumbersome and slow-moving organisms that formerly slumbered peacefully and ineffectively between annual sessions.

Everywhere they are re-organizing their procedure, re-writing their constitutions, simplifying their committee structures. The objective is quick, effective, representative action. Committee membership is becoming a real task and a real responsibility; not simply a recognition of worth or a handy means of placating malcontents.

The reason is clear. Medicine is now called upon to play a real part in the social and economic readjustments of these times. It has a duty to perform outside the consulting room, and everywhere doctors are getting ready to perform that duty.

New York's Proceedings

The proceedings of the last annual meeting of the New York State Medical Association printed in the *New York State Journal of Medicine* for June 15, admirably illustrate this new atmosphere among medical societies.

Like the Minnesota State Medical Association, New York is revising its constitution and reorganizing its committee structure. The object is to coördinate the overlapping committee activities and bring all of them under one directing body.

Together with many other progressive state societies, New York's House of Delegates has a Speaker as presiding officer. The Minnesota House of Delegates adopted this highly desirable change of procedure at its 1936 session.

It is interesting to note, in the account of New York's proceedings, what a wide variety of interests were reflected in the resolutions introduced by members from the floor. They ranged

from strictly organization detail to licensure, compensation, medical inspection of school children, asphyxial deaths, group insurance, the eight hour day, child labor, state medicine and even world peace.

Many Reference Committees

It is interesting to note, also, that this huge volume of resolutions, recommendations and committee reports was referred, not to one, but to many Reference Committees for study and recommendation. This method of handling, undoubtedly, gives an opportunity for many delegates to participate actively in the conduct and decisions of the society.

The New York society is larger by many times than the Minnesota organization, but its problems are much the same and its manner of handling them not greatly different from the procedure in Minnesota. It is worthy of note that, with far less money to spend and with other obvious limitations, Minnesota has succeeded in setting up an organization—thanks to its alliance with the Minnesota Public Health Association—that is comparable to those of many larger and wealthier organizations.

The revision of Minnesota's constitution is proceeding, in general, along the same lines as the New York revision and is at the same point in procedure: that is, it has had a preliminary introduction to the House of Delegates preparatory to final changes and adoption next year.

Medicine—A Thorn in the Flesh of Spending

By JOHN T. LELAND, M.D.
Herman, Minnesota

Because Johnnie Q. Public wants to buy an auto on the put-off-until-tomorrow-what-you-should-do-today plan, because his radio, electric refrigerator and whatnot are likewise agreeably "segmentally" deferred, his obligation to the physician becomes a national problem. State medicine is to become the Spartan shield to protect this same Johnnie Q. Public from the inadvertent and inconsiderate intrusion of the uncouth doctor's fee which has the presumption to intrude upon an otherwise free and joyous dispensation of his pay check. Responsibility becomes the skeleton at the banquet of unrestricted spending, and medicine, the joy killer of chasing-your-tail payments, is selected as the problem alibi.

Elevated from its humble origin as a plain old fashioned debt, it is blatantly heralded as a national responsibility. Would anyone dare to suggest that auto buying should be the state's affair? That the fee of the doctor who conducts into this vale of tears a future purchaser of automobiles should be so considered, seems to have occurred to no one as paradoxical. Fees for medical care become a burden debt of a sudden because they disrupt the smooth seductive flow of time payments toward the newest model of automobile.

Sickness, that morbid thing which the modern spirit of mad buying hopes to consign to the limbo of a managed medicine, is to become the barker's delight along the midway of politics.

As long as sickness is considered a calamity that chills the halleluja of the proverbial inebriate sailor's pocketbook, rather than about the only steadying consideration that is capable of bringing the loose ends of family ties together in a realization of what we all really live for anyway, just so long may we expect the government or state to tune those ties into the strumming lutes for political patronage.

What justification is there in assuming that a doctor's bill, of all bills, is the unbearable burden? Is it, perchance, because it is not incurred every thirty days? Is it because credit is extended after sixty days in default of payment? Is it because the doctor advertises in so seductive a manner as to induce one to obligate himself when he should not? Is it because the service he has rendered demands a continuous upkeep? Is it because he gave the Jones's something you envy and must, too, obtain by hook or crook?

No. Then just why is the doctor's fee an imposition and a burden? It is because the doctor's fee threatens to keep the time payments from gumming up Johnnie Q. Public's rainy day deficit.

Taking Care of Injured Workers

Late reports from WPA headquarters show that an average of $15,000 a month is being paid to Minnesota physicians for care of injured WPA workers.

This amount is being spread with a considerable degree of evenness between the 800 physi-

cians all over the state who indicated their willingness to do this work.

A list of these physicians in each community is in the hands of work foremen and regional supervisors. The injured workman is sent to the physician of his own choice if possible. If not, or if he has no choice, he is sent to the men on the list in rotation and having regard, of course, to distance and convenience.

This phase of the WPA program has been placed by law under the supervision of the United States Employees Compensation Commission and is subject to the commission's regulations. It is working very smoothly, for the most part, according to WPA officials, and with a minimum of dissatisfaction.

C C C Camps

It is interesting to physicians to note, also, that the new arrangements whereby medical care for all but the remote CCC camps is handled by local physicians is working out satisfactorily both to the doctors and to the WPA. In these cases first aid is administered by some layman at the camp especially trained for the purpose.

Minnesota State Board of Medical Examiners

To the Members of the Medical Profession:

Re Zanitone Company
Re Zanitone Liquid Herbs
Re Floyd R. Johnstone

The attention of the Minnesota State Board of Medical Examiners has been called to the activities of one Floyd R. Johnstone, a man about forty-five years of age, who is not authorized to practice healing in any manner in the State of Minnesota. Johnstone was at Warren, Minnesota, on June 20, 1936, at which time he was driving a Cadillac sedan, and was accompanied by a lady. He was distributing circulars and samples for "Zanitone Liquid Herbs." This preparation, which is advertised as a blood remedy and sells for the modest price of one bottle for $1.00, three bottles for $2.00 and hospital size bottle for $5.00, is also advertised as a remedy for prostate trouble, rheumatism, constipation and menstruation irregularities. Johnstone had stated that he would be at Warren for four days, but left rather suddenly.

The Medical Board would like to question him concerning his activities and the distribution of this circular.

If this man, or any one representing Zanitone Liquid Herbs, Post Office 82, Oklahoma City, Oklahoma, should appear in your community, please telephone or wire collect, the State Board of Medical Examiners at 524 Lowry Medical Arts Building, St. Paul, Minnesota.

List of Physicians Licensed by the Minnesota State Board of Medical Examiners on May 4, 1936

(April Examination)

Allen, Pliny Arunah, Harvard U., M.D., 1934, Rochester, Minn.
Barr, James Adam, Stanford U., M.D., 1934, Rochester, Minn.
Bender, James Howard, U. of Minn., M.B., 1935, Two Harbors, Minn.
Bowers, John Gerald, U. of Minn., M.B., 1933; M.D., 1934, Eloise, Mich.
Burlingame, David Albert, U. of Minn., M.B., 1935, St. Paul, Minn.
Chessen, James, U. of Wis., M.D., 1935, Duluth, Minn.
Corson, Ada Catherine, U. of Minn., M.B., 1935, Minneapolis, Minn.
Concklin, Charles Lewis, U. of Minn., M.B., 1935, Minneapolis, Minn.
Deagen, James Richard, U. of Minn., M.B., 1935, St. Paul, Minn.
Earl, John Robert, Harvard U., M.D., 1933, St. Paul, Minn.
Eckhardt, Carl Lambert, U. of Minn., M.B., 1935, Minneapolis, Minn.
Ehmke, Edwin Charles, U. of Minn., M.B., 1935, Minneapolis, Minn.
Frey, Norbert Bernard, U. of Minn., M.B., 1935, Minneapolis, Minn.
Goldberg, Milton, U. of Minn., M.B., 1936, Minneapolis, Minn.
Grau, Robert Kenneth, U. of Iowa, M.D., 1933, St. Paul, Minn.
Groff, Jesse Emmert, U. of Cincinnati, M.D., 1934, Rochester, Minn.
Hartmann, Clarence Melchior, Creighton U., M.D., 1935, St. Paul, Minn.
Heidrich, Otto Fred, U. of Minn., M.B., 1935, Minneapolis, Minn.
Hill, Robert Jodoin, U. of Minn., M.B., 1935, St. Paul, Minn.
Hoffman, Walter Lees, U. of Minn., M.B., 1935, St. Paul, Minn.
Hutton, John Huntington, U. of Mich., M.D., 1927, Rochester, Minn.
Jewett, Robert Emmett, Indiana U., M.D., 1934, Rochester, Minn.
Johnson, Percy, U. of Minn., M.B., 1935, Indianapolis, Ind.
Johnson, Robert Emanuel, U. of Minn., M.B., 1935, Minneapolis, Minn.
Kelly, Hobart Martin, U. of Wis., M.D., 1932, Rochester, Minn.
Kendrick, Thomas Douglas, U. of Toronto, M.B., 1928; M.D., 1928, Rochester, Minn.
Kermott, Louis Henry, Rush Med. Col., M.D., 1935, Rochester, Minn.
Kraft, Haldon Charles, Indiana U., M.D., 1930, Rochester, Minn.
Laird, Donald Roth, Rush Med. Col., M.D., 1934, Rochester, Minn.
Lenz, Bernard Thomas, U. of Minn., M.B., 1935, Minneapolis, Minn.
Lysne, Myron, U. of Minn., M.B., 1935, St. Paul, Minn.
McDaniel, J. Zeb., U. of Georgia, M.D., 1932, Rochester, Minn.
Merricks, James Wesley, Jr., Rush Med. Coll., M.D., 1934, Rochester, Minn.
Middleton, Anthony Wayne, U. of Pa., M.D., 1934, Rochester, Minn.
Moody, Leonard Wood, Rush Med. Coll., M.D., 1935, St. Paul, Minn.
Mortensbak, Hjalmar Erwin, U. of Minn., M.B., 1935; M.D., 1936, Hanska, Minn.

Mount, William Maxwell, Indiana U., M.D., 1934, Rochester, Minn.
Mouritsen, Glenn Jesse, U. of Minn., M.B., 1935, St. Paul, Minn.
Mousel, Lloyd Harvey, U. of Neb., M.D., 1930, Rochester, Minn.
Nevitt, Donald Marion, U. of Minn., M.B., 1935, St. Paul, Minn.
Nilles, Leonard John, U. of Minn., M.B., 1935, Minneapolis, Minn.
Nissen, Archie Sophus, U. of Minn., M.B., 1934; M.D., 1935, St. Peter, Minn.
Noonan, William Joseph, U. of Chicago, M.D., 1935 (Div. Biological Sciences), St. Paul, Minn.
Olsen, Arthur Martin, Rush Med. Coll., M.D., 1935, Rochester, Minn.
Pasek, Antone William, U. of Minn., M.B., 1935, Cloquet, Minn.
Proeschel, Ray Kenneth, U. of Minn., M.B., 1935, Duluth, Minn.
Puumala, Reino Hendrick, U. of Ill., M.D., 1934, Chicago, Ill.
Rudin, David N., U. of Minn., M.B., 1936; M.D., 1936, Minneapolis, Minn.
Schleinitiz, Fritz Bruno, U. of Minn., M.B., 1935, Minneapolis, Minn.
Schmidt, Walter Robert, U. of Minn., M.B., 1934; M.D., 1935, St. Paul, Minn.
Schweiger, Theodore Robert, U. of Minn., M.B., 1935, St. Paul, Minn.
Seltz, Herman, U. of Minn., M.B., 1935, Minneapolis, Minn.
Siegel, Clarence, U. of Minn., M.B., 1935, Eveleth, Minn.
Silver, Henry, U. of Minn., M.B., 1935, Minneapolis, Minn.
Simons, Stanley John, U. of Minn., M.B., 1935, St. Paul, Minn.
Sinykin, Melvin Bernard, U. of Minn., M.B., 1935, Minneapolis, Minn.
Smith, Lucian Anderson, Rush Med. Coll., M.D., 1935, Rochester, Minn.
Sprague, Randall George, Northwestern, M.D., 1935, Rochester, Minn.
Swift, Edward Virginius, U. of Texas, M.D., 1933, Rochester, Minn.
Underdahl, Laurentius Olaves, U. of Minn., M.B., 1935, St. Paul, Minn.
Washburn, Richard Nathaniel, Rush Med. Coll., M.D., 1935, Rochester, Minn.
Young, Henry Herman, Rush Med. Coll., M.D., 1935, Rochester, Minn.

By Reciprocity

Coventry, William Dean, U. of Mich., M.D., 1930, Duluth, Minn.
Crawford, Helen Lucile, Rush Med. Coll., M.D., 1930, Winona, Minn.
Doehring, Carl Frederic, Rush Med. Coll., M.D., 1928, Rochester, Minn.
Trandem, Clarinda Elinor, Woman's Med. Coll., Pa., M.D., 1929, St. Paul, Minn.
Wolfe, Albyn Garrett, U. of Ill., M.D., 1934, St. Paul, Minn.

By National Board

Wells, Arthur Herman, Harvard U., M.D., 1930, Duluth, Minn.

List of Physicians Licensed by the Minnesota State Board of Medical Examiners on July 8, 1936

(June Examination)

Anderson, Nina Augusta, U. of Minn., M.B., 1935, St. Paul, Minn.
Bloedel, Traugott J., U. of Minn., M.B., 1936, Minneapolis, Minn.
Breck, Louis William, Northwestern, M.B., 1932; M.D., 1933, Rochester, Minn.
Derifield, Randall S., U. of Minn., M.B., 1934; M.D., 1936, Minneapolis, Minn.
Duncan, David Gale, Creighton U., M.D., 1936, Minneapolis, Minn.
Guilfoile, Pierre Joseph, Marquette U., M.D., 1936, Minneapolis, Minn.
Haves, Albert Franklin, U. of Minn., M.B., 1936, St. Paul, Minn.
Keller, Emil Theodore, U. of Minn., M.B., 1935, Sioux Falls, S. D.
Klein, Joseph Clarence, Marquette, M.D., 1936, St. Paul, Minn.
Kowallis, George Frank, U. of Pittsburgh, M.D., 1931, Rochester, Minn.
Leick, Richard Mathias, U. of Minn., M.B., 1936, St. Paul, Minn.
McCarten, Francis Michael, Creighton U., M.D., 1933, Stillwater, Minn.
McDonough, Francis Edward, U. of Wis., M.D., 1934, Rochester, Minn.
McElmeel, Eugene Francis, U. of Minn., M.B. and M.D., 1936, St. Paul, Minn.
McNearney, James Joseph, U. of Minn., M.B., 1936, Minneapolis, Minn.
Mahle, Donald George, U. of Minn., M.B., 1935, South St. Paul, Minn.
Mattison, Robert E., U. of Minn., M.B., 1935, Minneapolis, Minn.
Nyvall, Pierre John, U. of Minn., M.B., 1934; M.D., 1935, Minneapolis, Minn.
Odessky, Louis, U. of Minn., M.B. and M.D., 1936, St. Paul, Minn.
Oltman, Jane Elizabeth, U. of Minn., M.B., 1934; M.D., 1935, Minneapolis, Minn.
Quello, Robt. Oscar Beresford, U. of Minn., M.B., 1935, Fergus Falls, Minn.
Rick, Paul Fred'k Wm., U. of Minn., M.B., 1936, St. Paul, Minn.
Rigos, Frank Joseph, U. of Minn., M.B., 1936, San Francisco, Cal.
Risch, Ronald Eugene, U. of Minn., M.B., 1935, Appleton, Minn.
Risser, Alden Fairchild, U. of Minn., M.B., 1935, St. Paul, Minn.
Sorenson, Kermit Ronald, U. of Minn., M.B., 1935, Glenwood, Minn.
Spang, James Scollard, Marquette U., M.D., 1936, Grand Rapids, Minn.
Swedberg, William Alfred, U. of Minn., M.B., 1933; M.D., 1934, Minneapolis, Minn.
Van Valkenburg, John D., U. of Minn., M.B., 1935, Floodwood, Minn.
Wall, William Lewis, U. of Minn., M.B., 1933; M.D., 1934, Anoka, Minn.

By Reciprocity

Beckering, Gerrit, Northwestern U., M.D., 1930, Edgerton, Minn.
Glassberg, Irving Jeffery, U. of Minn., M.B., 1934; M.D., 1935, Minneapolis, Minn.
Kortsch, F. Paul, U. of Colo., M.D., 1935, St. Paul, Minn.
Lyght, Charles Everard, Queens U., M.D., C.M., 1926, Madison, Wis.
McNaughton, Lawrence Marvin, U. of Ark., M.D., 1933, Bena, Minn.

National Board Credentials

Houston, Donald McClure, U. of Minn., M.B., 1934; M.D., 1935, Park Rapids, Minn.

OF GENERAL INTEREST

Dr. V. E. Quanstrom of the Beise Clinic, Brainerd, has moved to New Orleans, Louisiana.

* * *

Dr. Ward Akester of Marshall has moved into new office quarters in the Abbott insurance building.

* * *

Dr. M. J. McKenna, formerly of Graceville, has become associated with Drs. Jolin and Jolin of Grand Rapids, Minnesota.

* * *

Dr. W. W. Will of Bertha, who together with his family has been spending the past few weeks in California, has returned home.

* * *

Dr. L. R. Bouma of Saint Paul recently won honors in a skeet shoot by breaking forty-eight of fifty targets at the Riverview Rod and Gun Club.

* * *

Dr. T. C. Clark of Minneapolis was recently elected surgeon of the United Spanish War Veterans at their annual convention held in Saint Paul.

* * *

Dr. A. F. Risser of Saint Paul, who finished his internship at Miller Hospital recently, became associated August 1 with Dr. C. E. Fawcett at Stewartville, Minnesota.

* * *

Dr. and Mrs. A. M. Aanes of Red Wing celebrated their twenty-fifth wedding anniversary June 28. Their son, Russell, is serving his internship at the Minneapolis General Hospital.

* * *

Dr. D. Nolan, a graduate of the University of Minnesota medical school in June, has located at Amboy, Minnesota, where he will be associated in practice with his brother, Dr. L. E. Nolan.

* * *

Dr. Carl L. Eckhardt, who completed his internship at Asbury Hospital, Minneapolis, in June, has been appointed camp physician for Camp Lawrie, Boy Scout camp in the North Star scout area.

* * *

Dr. Gilbert Thomas of Minneapolis was elected president of the American Urological Association at its meeting in Boston in May. The Association will hold its next annual meeting in Minneapolis in 1937.

* * *

Dr. R. H. Puumala began the practice of medicine in Cloquet, Minnesota, July 15. Dr. Puumala is a graduate of the University of Illinois where he received his M.D. degree in 1933 and his M.S. degree in 1935.

* * *

Dr. Arthur D. Whiting of St. Cloud recently completed thirty-nine years of continuous practice in the same location. He has practiced his specialty of eye, ear, nose and throat work in St. Cloud since December 1, 1897.

Dr. J. C. Klein, who recently completed his internship at St. Joseph's Hospital, Saint Paul, will be associated in practice with Dr. F. H. Buck at Shakopee, where Dr. Buck completed twenty-five years of practice in June.

* * *

William N. Freeman, son of Dr. and Mrs. William L. Freeman of St. Cloud, entered Cook County Hospital, Chicago, July 1, where he will serve his internship until January 1, 1938. He is a graduate of Rush Medical College.

* * *

Dr. A. G. Chadbourn of Heron Lake has announced that Dr. L. H. Hammerstad, who has just completed his internship at Swedish Hospital, Minneapolis, will be associated with him in practice at Heron Lake beginning August 15.

* * *

Dr. W. McK. Craig of Rochester and Dr. James J. Morrow of Austin were elected to serve on the Board of Directors of the Minnesota Surgical Society at the annual meeting held in Duluth in July. They will each serve for a term of three years.

* * *

News has been received of the death of Mrs. L. F. Woodworth, wife of Dr. Woodworth of Le Center, which occurred in June. Mrs. Woodworth is survived by her husband, one son, Leonard, four brothers, all of Le Center, and two sisters.

* * *

Dr. John G. Lohmann of Fergus Falls and Miss Anastasia Hodgson of that city were united in marriage in June. Dr. and Mrs. Lohmann are making their home in Fergus Falls, where Dr. Lohmann is a member of the medical staff of the state hospital.

* * *

Dr. Frank Naegeli, who finished his course in medicine at the University of Minnesota this June, is recovering from a recent operation for appendicitis which delayed his going to New Jersey where he had planned on spending a year as intern in the Jersey City Hospital.

* * *

Dr. S. J. Simons, who recently completed his internship at Bethesda Hospital, Saint Paul, has established an office in Akeley, Minnesota, where he has entered the general practice of medicine and surgery. Dr. Simons is a graduate of the University of Minnesota.

* * *

Dr. Earl A. Loomis of Minneapolis has returned from a trip to California where he and Mrs. Loomis spent several weeks visiting his sons, Dr. George Loomis of San Francisco, and Donald Loomis of Hollywood. Mrs. Loomis will spend the remainder of the summer in the west.

* * *

The marriage of Dr. Bernard A. Flesche of Lake City and Miss Kathleen C. Dohan of Saint Paul was solemnized at St. Luke's church, Saint Paul, on July 16. Dr. and Mrs. Flesche are now at home in Lake

City, where Dr. Flesche has been practicing medicine and surgery since October 1934.

* * *

Funeral services for Walter Bacon, son of Dr. Harry Bacon of Minneapolis, staff physician for the U. S. Veterans' Administration, were held in San Gabriel, California, in June. Dr. Bacon's son died following an automobile accident near Walker Mine, California, where he was employed. He was a graduate of the School of Mines, University of Minnesota.

* * *

With the authorization of the Virginia hospital commission, a staff of thirteen local physicians and surgeons has been organized to act in an advisory capacity to the five members of the board, which will manage and operate the city's municipal hospital. Dr. C. B. Lenont was named president of the staff, with Dr. C. E. Goodman, vice president, and Dr. J. A. Malmstrom, secretary.

* * *

Dr. Anthony J. Spang and Dr. James A. Spang, brothers, will establish a general practice together in Duluth, where they opened offices last month. Dr. A. J. Spang for the past year has conducted a general practice in Buhl besides being medical director of the St. Louis County Hospital at Buhl. Dr. A. V. Fankboner of Mountain Iron will have charge of the county hospital at Buhl.

* * *

The marriage of Miss Margaret Hayes of Indianapolis, Indiana, and Dr. C. P. Johnson of Hendricks, Minnesota, took place June 29 in Indianapolis. Dr. Johnson is a graduate of the University of Minnesota medical school and Mrs. Johnson is a graduate of the Indiana University nurses' training school. They will live for a time in Minneapolis following their return from their wedding journey.

* * *

Dr. C. H. Buckley opened an office in Menomonie, Wisconsin, July 10. After graduating from the University of Minnesota medical school in 1932, Dr. Buckley interned at Grand Hospital, Chicago, then spent two years as surgeon in CCC camps in northern Minnesota and has been associated for several months with Dr. Kalinoff at Stillwater. Dr. Buckley has been a member of the Washington County Medical Society and his fellows wish him success in his new location.

* * *

Dr. and Mrs. D. Kalinoff of Stillwater, Minnesota, celebrated their twenty-fifth wedding anniversary at their home on June 7. Later they motored to Northampton, Massachusetts, where they attended commencement exercises at Smith College, from which their daughter, Naidena, was graduated this year. On the way home they stopped at Ann Arbor, Michigan, where they participated in the thirty-fifth anniversary functions of the Class of 1901, of which Dr. Kalinoff is a member.

Dr. H. A. Reimann, for the past six years Professor of Medicine and Chief of the Medical Service at the University Hospital, Minneapolis, has accepted the position as Magee Professor of the Practice of Medicine and Clinical Medicine at the Jefferson Medical College, Philadelphia, the position held by Dr. Thomas McCrae until his death last year. Dr. Reimann graduated from the Medical School of the University of Buffalo in 1921, spent three years at the Rockefeller Institute, a year with Professor Ghon at Prague and two years at the Rockefeller Institute in Peking, China, before coming to the University of Minnesota. His energies have been directed to clinical research and teaching and he has made notable contributions to the clinical phases of bacterial infections, including the pneumococcus group, Rocky Mountain spotted fever and staphylococcus pneumonia. Jefferson Medical College is to be congratulated on the acquisition of Dr. Reimann and the best wishes of the medical profession of the State of Minnesota will accompany him when he takes up his new duties about September 1.

Amercian Board of Obstetrics and Genecology

The next written examination and review of case histories of Group B applicants by the American Board of Obstetrics and Gynecology will be held in various cities in the United States and Canada on Saturday, November 7, 1936.

Application blanks and booklets of information may be obtained from Dr. Paul Titus, Secretary, 1015 Highland Bldg., Pittsburgh (6), Pennsylvania. Applications for this examination must be filed in the Secretary's Office 60 days prior to the scheduled date of examination.

SARCOMA OF THE OVARY

(Continued from Page 538)

¾ inch tall. Up to the present time she has menstruated irregularly but is feeling very well and has no symptoms, no physical complaints, nor any clinical evidences of any illness.

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COMMUNICATION

BIOPSY

To the Editor: I have read the article by Kennedy in the *Medical Record* and gone over it very carefully. You ask for a statement from me as to what I consider objectionable in the editorial in the MINNESOTA MEDICINE for February, 1936.

First of all, I am perfectly willing to admit I am a little "touchy" regarding this question of biopsy because it seems to me to be a valuable procedure to one who is actively engaged in surgical pathology and general surgery, because, after all, anything which eliminates the guesswork in medicine certainly has value.

Referring specifically to the editorial in the MINNESOTA MEDICINE, you mention Kennedy's statement in which he admits doing a biopsy on a suspicious appearing cervical lesion and he immediately followed this by an operation when it proved to be malignant.

No one, as far as I know, is certain of the diagnosis of cancer from its gross appearance in its earliest stages and this is particularly true in the cervix, the Schilling test and every other sign outside of actual biopsy to the contrary notwithstanding. Isn't it better to take a piece of the tissue and find out as early as possible if it is cancer and then treat the patient accordingly with radium, x-ray, surgery, or any of the three in combination,

It seems to me that counselling doctors not to do a biopsy because of the risk of spreading the cancer is dangerous, because it encourages them to wait until the diagnosis of a malignant growth is obvious; on the other hand, without the benefit of biopsy information they will unnecessarily treat radically many benign lesions, for example, in the uterus or in the breast.

Every one knows who has followed curettage that it is impossible to remove all of the endometrium, but it seems reasonable to me that the risk of spreading a cancer from removal of a few pieces of tissue is much less than the risk of an unnecessary hysterectomy on a uterus containing hypertrophic polypoid endometrium. This condition may give all the clinical symptoms found in a cancer in the body of the uterus.

As far as I know, no work, experimental or clinical, has been done to determine the exact time required for a metastasis to take place, although, of course, it does happen whether it is a matter of seconds, minutes, hours, or days. Kennedy mentions, as many others have, that after a cancerous growth was biopsied it grew more rapidly. Now, the fact of the matter is, there is no real evidence from a clinical standpoint to support this because we do not know the exact rate of growth of any cancer in the human body. There is, however, considerable evidence in experimental pathology of cancer, showing that biopsy has no influence whatever on the rate of growth of the Flexner-Jobling rat carcinoma. I refer specifically to the work done by Dr. Francis Carter Wood entitled "Experimental Pathology of Cancer." (Journal of American Medical Association, 84:4-8, 1925.)

In this work Dr. Wood used the well-known Flexner-Jobling rat carcinoma, which grows at a very regular rate and kills the rat within three or four months after transplantation. Wood biopsied these growths and without any attempt at cauterization of the biopsy site found that cutting into them had absolutely no influence on the rate of growth or metastasis. Of course, this is an animal cancer and a transplanted one, but until we have more accurate clinical evidence of the rate of growth and metastasis in the human family, it seems to me we had better heed the experimental evidence so clearly shown by Dr. Wood.

Dr. Bumpus, commenting on this same subject, said: "Biopsy has not to my knowledge resulted in the spreading of the growth or producing metastasis although such authorities as Thomas and Corbus warn against the practice. As parts of the neoplasm of the bladder break off from time to time as a result of the action of the musculature of the bladder, it is difficult to understand why the removal of a piece no larger than those frequently voided by the patient should result in spreading of the growth." (Journal of Urology, 21:371-380, 1929.)

Due to propaganda by the American Society for the Control of Cancer and by forward looking physicians, patients are constantly presenting themselves with suspicious lumps or lesions to their physician. After a careful history and physical examination the physician is not certain many times in these early lesions whether they are benign or malignant. The doctor must be able to tell the patient as accurately as possible, if he is fully to discharge his duty, that this is malignant or this is benign. As far as I can see, biopsy offers him the greatest certainty in making this most important diagnosis.

In doing a biopsy it is necessary "to get the right piece," as New has frequently said. If a biopsy specimen is negative, and the clinical history and clinical examination indicates malignancy should be present, more tissue must be removed because a negative biopsy examination is of no more value than any other negative laboratory test.

I hope, Dr. Drake, that I have made my position clear for I am interested as you and every other physician is who is forward looking, that the truth in medicine will come to the fore.

If there is any point in this letter which you would like to discuss further, I certainly would be pleased to hear from you.

Sincerely yours,
HAROLD D. CAYLOR, M.D.

EDITOR'S NOTE: The editorial referred to is one that appeared in the February number of MINNESOTA MEDICINE entitled "Biopsy Condemned" and was based on an article by Dr. J. W. Kennedy in the *Medical Record* of December 15, 1935.

The title "Biopsy Condemned" was unhappily chosen as the inference might be that all biopsy is to be condemned, an inference not at all intended nor advocated in the editorial. The statement that diagnostic curettage should be heartily condemned was Dr. Kennedy's idea and as used in the editorial appeared to be the editor's opinion. This is a pretty strong statement as there are doubtless indications for a diagnostic curettage. There are, however, competent gynecologists who do not rely entirely on curettement as an indication for hysterectomy. Repeated curettement in an effort to diagnose a malignancy of the corpus uteri might conceivably be to the detriment of the patient. That many curettements are not indicated is perhaps beside the point.

The main idea of Dr. Kennedy's article was that cutting into a cancer unnecessarily is undesirable. Most surgeons will agree. Otherwise why the wide excision of a cancer or the cautery knife? The purpose of the editorial was to emphasize this idea.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

Medical Broadcast for August

The Minnesota State Medical Association Morning Health Service.

The Minnesota State Medical Association broadcasts weekly at 9:45 o'clock every Tuesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month will be as follows:

August 4—Low Blood Pressure.
August 11—When School Starts.
August 18—Iron and Anemia.
August 25—Jaw Tumors.

Biological Photographic Association

The Biological Photographic Association extends a cordial invitation to all photographers and scientists interested, to visit its Sixth Annual Convention in Boston, September 24-26, 1936, at the Hotel Lenox.

Active membership is open to those whose duties include biological photography. Any one who is interested in such photography may become an associate member. The annual dues, including Journal subscription, are $3.00.

Applications should be addressed to the Secretary, Miss Anne Shiras, Magee Hospital, University of Pittsburgh, Pittsburgh, Pa.

International Assembly

The International Assembly of the Inter-State Postgraduate Medical Association of North America, under the presidency of Dr. David Riesman of Philadelphia, Pennsylvania, will be held in the public auditorium of St. Paul, Minnesota, October 12, 13, 14, 15, and 16, with pre-assembly clinics on Saturday, October 10, and post-assembly clinics, Saturday, October 17, in the hospitals of Saint Paul.

The aim of the program committee, with Dr. George Crile as chairman, is to provide for the medical profession of North America an intensive postgraduate course covering the various branches of medical science. The program has been carefully arranged to meet the demands of the general practitioner, as well as the specialist. Extreme care has been given in the selection of the contributors and the subjects of their contributions.

In coöperation with the Minnesota State Medical Association, the Ramsey County Medical Society will be host to the Assembly and has arranged an excellent list of committees who will function throughout the Assembly.

A most hearty invitation is extended to all members of the profession who are in good standing in their State or Provincial Societies to be present and enjoy the hospitality of the medical profession of Saint Paul. A registration fee of $5.00 will admit each member of the medical profession in good standing to all the scientific and clinical sessions.

A list of the distinguished teachers and clinicians who will take part on the program may be found on page xxii.

Special railroad rates will be in effect.

For further information, write Dr. W. B. Peck, Managing-Director, Freeport, Illinois.

Northern Minnesota Medical Association

The annual meeting of the Northern Minnesota Medical Association will be held at Fergus Falls, August 31 and September 1, 1936. The banquet will be held at the State Hospital on invitation of Dr. W. L. Patterson, superintendent, and his staff. Dr. O. J. Hagen of Moorhead will act as toastmaster, the dinner to be followed by the president's address by Dr. Arthur N. Collins and an address entitled "Vanishing Hosts" by the guest speaker, Dr. W. L. Strunch of Decorah, Iowa.

The present officers are: Dr. A. N. Collins, president; Dr. O. O. Larson, Detroit Lakes, secretary. Dr. F. J. Hirschboeck, Duluth, chairman of the Program Committee, has arranged the following interesting program:

1. The Medical School and the Practicing Physician.
   H. S. Diehl, M.D., Univ. of Minn.
2. Acute Abdominal Symptoms Complicating Diagnosis, with Case Reports.
   J. L. McLeod, M.D., Grand Rapids
3. Pilonidal Sinus and Its Treatment.
   W. G. Strobel, M.D., Duluth
4. Dyspnea and Dysphagia of Unusual Origin.
   D. J. Schwartz, M.D., Minneapolis
5. The Significance of Anatomical Features of the Vermiform Appendix in the Genesis of Acute Appendicitis.
   O. H. Wangensteen, M.D., Univ. of Minn.
6. Recent Developments in Anesthesia.
   E. B. Tuohy, M.D., Rochester
7. Hemorrhoidectomy: A Plastic Operation.
   Newton D. Smith, M.D., Rochester
8. Eyeground Examinations as an Aid to Prognosis in General Medicine.
   M. F. Fellows, M.D., Duluth
9. Chronic Hyperthyroidism.
   C. I. Krantz, M.D., T. O. Young, M.D., Duluth
10. Recent Advances in Diabetes Mellitus.
    N. Stafne, M.D., Moorhead
11. Some Fevers Difficult of Diagnosis, with Case Reports.
    Moses Barron, M.D., Minneapolis
12. Silicosis on the Iron Ranges.
    C. Raadquist, M.D., Hibbing
13. Symptomatology of the Various Leukemic States.
    T. A. Peppard, M.D., Minneapolis
14. Interpretation of Heart Murmurs.
    M. A. Shillington, M.D., St. Paul
15. Missed Abortion.
    W. F. Mercil, M.D., Crookston
16. Clinic—Neuro Psychiatry.
    Dr. W. L. Patterson and Staff, Fergus Falls State Hospital for the Insane

Wabasha County

The sixty-eighth annual meeting of the Wabasha County Medical Society was entertained at Wabasha, Thursday, July 9, by Drs. J. A. Slocumb and H. T. Sherman of Plainview and E. W. Ellis of Elgin.

There were twenty-three in attendance, including ladies, members and guests. At the business session in the late afternoon, an amendment was offered changing the date of annual meetings to the first Thursday after the first Monday in October. A revised and amended fee-schedule was adopted. The following officers were elected for the coming year: President, Dr. B. A. Flesche, Lake City; vice president, Dr. J. S. Collins, Wabasha; secretary-treasurer, Dr. W. F. Wilson, Lake City. Dr. E. C. Bayley, Lake City, was elected delegate to the State Association; Dr. B. J. Bouquet, Wabasha, Alternate. Censor for three years, Dr. J. A. Slocumb, Plainview. Upon invitation, it was voted to hold the next annual meeting at Wabasha.

Following dinner served at the Hotel Anderson, the following scientific program was presented:

President's Address—"Branchial Cyst with Case Report"
DR. C. G. OCHSNER, Wabasha.
"The Differential Diagnosis Between Functional and Organic Nervous Diseases"
DR. E. M. HAMMES, St. Paul.
"Infectious Fibrositis"
DR. C. H. SLOCUMB, Mayo Clinic, Rochester.
"Mutual Relationships of Physicians"
DR. B. J. BRANTON, Willmar, Representing a committee of the State Medical Association.

Dr. H. Z. Giffin, councilor for the First District, being present and called upon, made a few remarks concerning medical welfare and solidarity.

Special entertainment was provided for the ladies in attendance during the evening. Before adjournment, a rising vote of thanks was tendered the guest speakers, and all those who had a part in the entertainment at this occasion.

W. F. WILSON, M.D., *Secretary.*

* * *

Wabasha County Medical History

Few county societies go back as far as the Wabasha County Medical Society. On July 9, 1936, this society held its sixty-eighth annual meeting, the society having had its origin on June 25, 1869, when an informal meeting of doctors was held in Lake City, Dr. F. H. Milligan of Lake City acting as chairman and Dr. E. C. Spaulding, also of Lake City, acting as secretary.

A constitution and by-laws were adopted at the next meeting, November 25, 1869, and a seal consisting of a medical caduceus inscribed "Wabasha County Medical Society, organized 1869," is still in the possession of Dr. W. F. Wilson of Lake City, who has acted continuously as secretary of the society since 1896, except for one year when he was president.

The next meeting was held at Lake City on December 28 of the same year. A paper by Dr. Milligan entitled, "Why Should Doctors Disagree," was presented as a feature of this meeting. Among the seven or eight physicians present was Dr. G. R. Patton of Cincinnati, Ohio, who soon afterward established his residence in Lake City. Also present at the meeting, according to the minutes, was L. H. Garrard of Frontenac, who was elected an honorary member of the society.

Charter members of the group include: Dr. F. H. Milligan, Wabasha; Dr. R. N. Murray, Lake City; Dr. H. W. Spafford; Dr. R. C. Remondino; Dr. Isaac J. Wells; Dr. E. C. Spaulding, Lake City; Dr. E. J. Baker, Durand, Wis.; Dr. J. P. Waste, Plainview; Dr. N. B. Axtell, Pepin, Wis.; Dr. G. R. Patton; Dr. J C. Adams; Dr. B. F. LaRue, Lake City, and Dr. Teft of Plainview, who joined the group soon after the original meeting.

In those early days, membership in the group was not limited to the profession of Wabasha County, but included physicians in territory adjacent in Wisconsin and Minnesota. Physicians prominent in the state, such as the Doctors Mayo, Dr. Staples of Winona, Dr. Hewitt of Red Wing, Dr. McDavitt of Saint Paul, and some others, were elected honorary members and frequently attended meetings.

In 1903, the Wabasha County Medical Society affiliated and became a component part of the Minnesota State Medical Association.

On March 10, 1906, a banquet sponsored by the society was held in honor of Dr. J. C. Adams of Lake City on the occasion of his seventy-fifth birthday. He was presented with a gold-headed cane by his medical friends as a testimonial of the fact that he had practiced successfully in this locality for many years and was a typical example of the able practitioner and beloved family physician of the old school.

At the meeting held in 1910, the first steps were taken by the society towards securing a tuberculosis sanitarium for this county, which culminated in the establishing of Buena Vista Sanatorium at Wabasha. Dr. E. H. Bayley of Lake City was chairman of the first commission and held that position until his death.

The society did its part during the World War in the matter of national defence and active participation. Several special meetings were held in regard to this matter and as a result five members enlisted in military service, and all other members enrolled in the Volunteer Medical Service Corps.

Throughout its history the society has been active in all matters pertaining to the promotion of Public Health and Public Health Education. Several years ago a campaign was instituted to get all newspapers published in the county to carry articles on these subjects contributed by local physicians and officers of the State Medical Association. There was a wide response to this campaign and at one of the annual meetings of the officers of the State Medical Association this county was especially complimented for its coöperation in this regard. Not long ago, such matters as encouraging pasteurization of milk, sewage and garbage disposal, and other sanitary measures were brought about largely through the influence of the society.

Dr. Wilson has, in his possession, the fee schedule of the Wabasha County Medical Society adopted November 25, 1869. It is interesting to note that the fees for the commoner services such as calls, country trips,

office consultations, and minor procedures were essentially the same as at the present time. Prices are given for operations and treatments now obsolete, while, of course, many of the modern day operations were not known at that time.

It is interesting to note that the present objects of the society are much the same as those expressed in the preamble to the constitution adopted in 1869:

"This association stands for the following principles:

1. Extend medical knowledge.
2. Advance medical science.
3. Maintain a high standard of medical education.
4. Promote public health.
5. Make the profession more capable and honorable within itself and more useful to the public in the prevention and cure of diseases and in prolonging and adding comfort to life."

Washington County

The Washington County Medical Society met May 12, 1936. No scientific papers were presented, the meeting being devoted to a general discussion of economic problems. Dr. George Earl, Councilor for the Fifth District, was a guest at the meeting and took part in the discussion.

E. S. Boleyn, *Secretary.*

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

Annual Report, The Rockefeller Foundation, 1935. 479 pages, paper cover. Illus. New York: The Rockefeller Foundation, 1936.

Williams Obstetrics. Seventh Edition. Henricus J. Stander, M.D., F.A.C.S. Professor of Obstetrics and Gynecology, Cornell University Medical College, etc. 1,269 pages. Illus. Price, $10.00, cloth binding. New York: D. Appleton-Century Co., 1936.

Theory and Practice of Psychiatry. William S. Sadler, M.D., Chief Psychiatrist and Director, Chicago Institute of Research and Diagnosis, Consulting Psychiatrist to Columbus Hospital, etc. 1,231 pages. Price, cloth, $10.00. St. Louis: C. V. Mosby Co., 1936.

Heart Disease and Tuberculosis. S. Adolphus Knopf, M.D. (New York University and Paris). 108 pages. Illus. Price, cloth, $1.25. Livingston, N. Y.: The Livingston Press, 1936.

Facts About Commercially Canned Foods. Issued by The American Can Company, 1936. 34 pages cloth covered.

WOMAN'S AUXILIARY

Mrs. F. J. Elias, *President,* Duluth, Minn.
Mrs. L. W. Barry, *Editor, Press and Publicity,* 2193 Sargent Ave., St. Paul, Minn.

PRESIDENT'S ADDRESS*

Mrs. E. M. Hammes
Saint Paul

Mr. President, Ladies and Gentlemen:

I do not know which is greater, my sense of humor, or my sense of fear at the idea of *my* being on a program with so many of the great in medical circles.

However, as a long-time member of the Medical Auxiliary, I am proud and glad to tell something of its achievements.

The Auxiliary occupies a unique position between the medical profession and the laity, and is increasingly becoming a very useful channel through which to transmit health education, always, of course, under the direction of the doctors, so that we hope Auxiliary usefulness is educational, as well as philanthropic and social, which latter is being so graciously examplified by this local Auxiliary, during the Convention.

We have reason to be proud of the fact that, numerically, we come third in Minnesota, Pennsylvania and Texas being the only Auxiliaries having more members. But it is our ambition to have 100% membership, and it seems odd to me that *all* doctors' wives would not want to join the Auxiliary and be glad to serve their husbands' profession. Why should we idly allow *other* women to direct health activities, when, as lay people, mingling with other lay people, we have the advantage of Auxiliary information, obtained from the medical profession?

Sometimes, remote County Auxiliaries become discouraged and think they are not accomplishing much, because, owing to long distances, bad roads, and so on, they cannot meet often or have much of a program. To them, I should like to say, that they do a lot, just by being organized and maintaining a spirit of goodfellowship among the doctors' families, and that we need them just as much as they need us.

Each incoming president hopes, in her year, to help forward a little further that which needs so much help —public health education from the viewpoint of the medical profession, and, to that end, we ask the advice and direction of the doctors, and the help and cooperation of *every* doctor's wife in the State of Minnesota.

*Presented at the annual meeting of the Woman's Auxiliary of the Minnesota State Medical Association, Rochester, Minnesota, June 4, 1936.